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UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

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UNIVERSITY OF ILLINOIS
GRADUATE COLLEGE

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1986-88 Graduate Programs

University of Illinois
at Urbana-Champaign

Information contained herein is for informational purposes only and is subject to change without notice. Individual departments and units should be contacted for further information. Courses, faculty assignments, prerequisites, graduation or completion requirements, standards, tuition and fees, and programs may be changed from time to time. Courses are not necessarily offered each semester or each year. The University retains the exclusive right to judge academic proficiency and may decline to award any degree, certificate, or other evidence of successful completion of a program, curriculum, or course of instruction based thereupon. While some academic programs described herein are designed for the purposes of qualifying students for registration, certification, or licensure in a profession, successful completion of any such program in no way assures registration, certification, or licensure by an agency not the University of Illinois.

University of Illinois administrative offices at Urbana-Champaign are open daily from 8:00 a.m. to 12:00 noon and 1:00 to 5:00 p.m. Monday through Friday, but not Saturdays, Sundays, or all-campus holidays which are indicated in the University Calendar.

Graduate College telephone: (217) 333-0035

An information center, available to visitors to the campus, is located in the north entrance lobby of the Illini Union. The center is open from 8:00 a.m. to 8:00 p.m. daily, including Saturdays and Sundays when classes are in session.

Small group information sessions about the campus are available at the Campus Visitor's Center in Levis Faculty Center, 919 West Illinois Street; visitors are welcome between 9:00 a.m. and 4:00 p.m. Monday through Friday, excluding campus holidays.

Campus telephone: (217) 333-1000

The policy of the University of Illinois is to comply fully with applicable federal and state nondiscrimination and equal opportunity laws, orders, and regulations. The University of Illinois will not discriminate in its programs and activities against any person because of race, color, religion, sex, national origin, ancestry, age, marital status, handicap, unfavorable discharge from the military, or status as a disabled veteran or veteran of the Vietnam era. This nondiscrimination policy applies to admissions, employment, and access to and treatment in University programs and activities.

For additional information on the equal opportunity and affirmative action policies of the University, please contact on the Urbana-Champaign campus: William A. Savage, Assistant Chancellor and Director of Affirmative Action Swanlund Administration Building, 601 East John Street, Champaign, IL 61820 (217) 333-0574.

1986-88
Graduate Programs

AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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UNIVERSITY CALENDAR — URBANA-CHAMPAIGN CAMPUS

A Graduate College calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained from the Graduate College, University of Illinois at Urbana-Champaign, 330 Administration Building, 506 South Wright Street, Urbana, Illinois 61801.

Spring Semester 1986

Jan. 20, Mon.	Martin Luther King's birthday observed (all-campus holiday)
Jan. 21, Tues.-Jan. 22, Wed., 5:00 p.m.	Registration
Jan. 23, Thurs., 7:00 a.m.	Instruction begins
Mar. 22, Sat., 1:00 p.m.-Mar. 30, Sun.	Spring vacation
Mar. 31, Mon., 7:00 a.m.	Instruction resumes
May 14, Wed.	Instruction ends
May 15, Thurs.	Reading day
May 16, Fri.-May 23, Fri.	Semester examinations
May 25, Sun.	Commencement
May 26, Mon.	Memorial Day observed (all-campus holiday)

Intersession 1986

May 27, Tues.	Instruction begins

Summer Session 1986

June 12, Thurs.-June 13, Fri., noon	Registration
June 16, Mon., 7:00 a.m.	Instruction begins
July 4, Fri.	Independence Day (all-campus holiday)
July 14, Mon.	Beginning of second four-week session
Aug. 6, Wed.	Instruction ends
Aug. 7, Thurs.	Reading day
Aug. 8, Fri.-Aug. 9, Sat.	Summer session examinations

Fall Semester 1986

Aug. 25, Mon.-Aug. 26, Tues., 5:00 p.m.	Registration
Aug. 28, Thurs., 7:00 a.m.	Instruction begins
Sept. 1, Mon.	Labor Day (all-campus holiday)
Nov. 26, Wed., 5:00 p.m.-Nov. 30, Sun.	Thanksgiving vacation
Nov. 27, Thurs.-Nov. 28, Fri.	Thanksgiving (all-campus holidays)
Dec. 1, Mon., 7:00 a.m.	Instruction resumes
Dec. 12, Fri.	Instruction ends
Dec. 13, Sat.	Reading day
Dec. 15, Mon.-Dec. 20, Sat.	Semester examinations

Spring Semester 1987

Jan. 19, Mon.	Martin Luther King's birthday observed (all-campus holiday)
Jan. 20, Tues.-Jan. 21, Wed., 5:00 p.m.	Registration
Jan. 22, Thurs., 7:00 a.m.	Instruction begins
Mar. 14, Sat., 1:00 p.m.-Mar. 22, Sun.	Spring vacation
Mar. 20, Fri.	Spring recess (all-campus holiday)
Mar. 23, Mon., 7:00 a.m.	Instruction resumes
May 13, Wed.	Instruction ends
May 14, Thurs.	Reading day
May 15, Fri.-May 22, Fri.	Semester examinations
May 24, Sun.	Commencement

Intersession 1987

May 25, Mon.	Memorial Day observed (all-campus holiday)
May 26, Tues.	Instruction begins

Eight-Week Summer Session 1987

June 11, Thurs.-June 12, Fri., noon	Registration
June 15, Mon., 7:00 a.m.	Instruction begins
July 3, Fri.	Independence Day observed (all-campus holiday)
July 13, Mon.	Beginning of second four-week term
Aug. 5, Wed.	Instruction ends
Aug. 6, Thurs.	Reading day
Aug. 7, Fri.-Aug. 8, Sat.	Summer session examinations

Fall Semester 1987

Aug. 24, Mon.-Aug. 25, Tues., 5:00 p.m.	Registration
Aug. 27, Thurs.	Instruction begins
Sept. 7, Mon.	Labor Day (all-campus holiday)
Nov. 25, Wed., 5:00 p.m.-Nov. 29, Sun.	Thanksgiving vacation
Nov. 26, Thurs.-Nov. 27, Fri.	Thanksgiving (all-campus holidays)
Dec. 11, Fri.	Instruction ends
Dec. 12, Sat.	Reading day
Dec. 14, Mon.-Dec. 19, Sat.	Semester examinations

Spring Semester 1988

Jan. 18, Mon.	Martin Luther King's birthday observed (all-campus holiday)
Jan. 19, Tues.-Jan. 20, Wed.	Registration
Jan. 21, Thurs.	Instruction begins
March 26, Sat.-April 3, Sun.	Spring vacation
May 11, Wed.	Instruction ends
May 12, Thurs.	Reading day
May 13, Fri.-May 20, Fri.	Semester examinations
May 22, Sun.	Commencement

Intersession 1988

May 23, Mon.	Instruction begins
May 30, Mon.	Memorial Day observed (all-campus holiday)

Summer Session 1988

June 9, Thurs.-June 10, Fri., noon	Registration
June 13, Mon.	Instruction begins
July 4, Mon.	Independence Day (all-campus holiday)
July 11, Mon.	Beginning of second four-week session
Aug. 3, Wed.	Instruction ends
Aug. 4, Thurs.	Reading day
Aug. 5, Fri.-Aug. 6, Sat.	Summer session examinations

GRADUATE EDUCATION AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The University of Illinois was founded in 1867 as the land grant institution of the State of Illinois. The University of Illinois is composed of two campuses — the original campus at Urbana-Champaign and the Chicago campus. (The Medical Center and Chicago Circle campuses were merged in 1982 as the University of Illinois at Chicago.)

From modest beginnings as the Illinois Industrial College, the Urbana-Champaign campus has grown to a community of about 36,000 students of whom 7,800 are enrolled in the Graduate College. The Urbana-Champaign campus is the center of graduate education in the University of Illinois system. A distinguished graduate faculty of approximately 2,200 members supervises and guides graduate study leading to advanced degrees in more than 100 fields of study.

The Graduate College is an administrative unit which has jurisdiction over all programs leading to advanced degrees. It is the statutory responsibility of the Graduate College to develop and safeguard standards of graduate work and to promote and assist research by faculty members and graduate students in all fields.

The responsibility for initiating, developing, and administering degree programs is delegated to the departments and other academic units. The Graduate College provides supporting services as well as general supervision to these degree-granting units. All postbaccalaureate students, except those in curricula leading to the degrees of Juris Doctor and Doctor of Veterinary Medicine, are enrolled in the Graduate College rather than in a disciplinary college.

GRADUATE FACULTY

The approximately 2,200 distinguished faculty members of the Graduate College are selected from among the University's most active

scholars — those who achieve national or international stature in their respective fields. A list of graduate faculty for each department or unit appears at the head of each departmental entry in the Programs of Study section.

GRADUATE DEGREES

The University of Illinois at Urbana-Champaign is a comprehensive graduate institution offering graduate degrees in more than 100 fields of study. In addition to the A.M. or M.S. and Ph.D. degrees offered in many disciplines, a number of departments offer work leading to other graduate degrees. Among these are master's and doctoral degrees in professional and performing arts fields and a number of master's degrees in teaching.

Descriptions of these degrees are given in the appropriate departmental sections of this *Graduate Programs* catalog. More detailed descriptions of graduate programs and the requirements for the degrees may be obtained from these individual departments.

JOINT DEGREE PROGRAMS

It is possible, with the prior approval of both departments, to pursue two postbaccalaureate degrees simultaneously. In certain approved combinations, the total time for the two degrees may be decreased by the acceptance of required courses in one degree program as electives in the other. Approved joint degree programs are the following: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Civil Engineering; Master of Architecture and Master of Computer Science; Master of Architecture and Master of Science in Finance; Master of Architecture and Master of Urban Planning; Master of Business Administration and Master of Science in Electrical Engineering; Master of Business Administration and Master of Public Administration; Master of Computer Science and Master of Accounting Science; Master of Human Resources and Family Ecology and Master of Social Work; Juris Doctor and Master of Accounting Science; Juris Doctor and Master of Business Administration; Juris Doctor and Master of Education; Juris Doctor and Doctor of Philosophy in Education; Juris Doctor and Master of Arts in Labor and Industrial Relations; Juris Doctor and Master of Arts in Public Administration; Juris Doctor and Master of Urban Planning. In addition, programs have been approved which enable the student to complete a four-year undergraduate program and a two-year graduate program in a total of five years. These include Bachelor of Arts in Liberal Arts and Sciences

and Master of Business Administration, Bachelor of Science in Computer Science and Master of Accounting Science, and Bachelor of Science in Accountancy and Master of Computer Science.

Further information on the above programs may be obtained from the appropriate program offices.

GRADUATE RESEARCH AND INSTRUCTIONAL RESOURCES

The University of Illinois at Urbana-Champaign is a comprehensive graduate institution. A distinguished graduate faculty, outstanding research facilities, one of the top-ranked libraries in the nation, and superior computer facilities make the Urbana-Champaign campus a stimulating environment for graduate study and research.

It is not possible to describe here all of the research facilities and educational opportunities available to graduate students on the Urbana-Champaign campus. The information on the following pages provides some description of the facilities and resources which are available to students and faculty in the ten broad fields of study of the disciplinary colleges — agriculture, applied life studies, commerce and business administration, communications, education, engineering, fine and applied arts, law, liberal arts and sciences, and veterinary medicine. The instructional and research programs of individual departments and of interdisciplinary and other graduate units are described in the Programs of Study section of this catalog.

UNIVERSITY LIBRARY

The University Library's resources for advanced study and research are exceptional. Its collections exceed 11 million items, including over 7 million volumes, 515,000 pamphlets, 522,000 maps and aerial photographs, 900,000 music scores and parts, and 2,000,000 microtexts. In addition, the library receives more than 93,000 periodicals, serials, and newspapers. This wealth of material is housed in the Main Library (4,100,000 volumes in the bookstacks) and thirty-eight departmental libraries at various locations about the campus.

Outstanding collections have been developed in a number of areas. In the humanities: classical literature and archaeology; English literature of the sixteenth through the twentieth centuries; Romance and Slavic literature; German literature of the sixteenth and seventeenth centuries; American humor and folklore; and comparative philology.

In the fine arts: architecture; landscape architecture; and music. In the social sciences: history of the western United States; Abraham Lincoln and the Civil War; Latin America of the revolutionary period; the Slavic countries; Ireland; medieval and modern Europe; international law; labor and industrial relations; and political science. In the sciences and technology: agriculture; biological sciences (especially entomology, ornithology, and parasitology); chemistry; geology; mathematics; and physics.

The Rare Book Room houses a superior collection of more than 200,000 volumes, including more than 1,000 incunabula. The collection has three major areas of strength: English history and literature, the history of geology, and the emblem book collection. The Milton collection is the finest in the world, including more than 400 different editions of his works published during the seventeenth and eighteenth centuries. The oldest printed book is a 1455 copy of the Book of Genesis of the Gutenberg Bible; the most valuable is the Audubon Folio on permanent display. The catalog of the collection has been published.

The completeness of the bibliographic and reference facilities makes any sort of research possible. In addition, interlibrary loan service is provided for faculty and graduate student research.

CENTER FOR ADVANCED STUDY

The Center for Advanced Study, a special academic unit of the Graduate College, is committed to recognizing excellence in scholarship and creative achievement. Through its associates and fellows programs, the center provides released time for selected faculty to expand their professional capabilities and to develop new research initiatives. The Resident Studies Program of the center is aimed at generating new programs and enhancing collaboration across departmental and institutional boundaries on issues of importance to the campus and society at large.

The center also administers the activities of the Miller Endowment Committee which each year invites distinguished men and women to the campus as Miller Visiting Professors and younger persons of promise as Miller Visiting Scholars. The Miller Committee annually sponsors the MILLERCOMM series of lectures, concerts, performances, and other events of broad cultural interest.

CAMPUS-WIDE RESEARCH SERVICES

The Campus-Wide Research Services Office (CWRSO) is a unit of the Office of the Vice-Chancellor for Research. Created in 1979 as a campus-level unit, CWRSO is responsible for collecting and dissem-

inating information on sponsors that support research and scholarship activities.

The CWRSO has the following resources available for faculty, staff, and students on the Urbana-Champaign campus: current literature on over 4,000 research and scholarship sponsors, reference publications, telephone directories of federal agencies, and handouts spanning topics from proposal preparation to University of Illinois at Urbana-Champaign rules and regulations pertaining to research.

Two databases are available for use by faculty and staff. A search of the Illinois Researcher Information System (IRIS) database identifies potential sponsors for faculty, staff, and graduate student research; teaching; travel; equipment; advanced study; and other activities. Information on more than 4,000 sponsors is contained in IRIS; this includes federal agencies, private and corporate foundations, and other organizations which support research and scholarship activities.

The Illinois Resource Network (IRN) database describes more than 80 percent of this campus's faculty research and scholarship interests and can search more than 20 informational items. Faculty annually update their profiles, and new profiles are added to the database as new faculty members join the University. The resulting database is a current reflection of the research, teaching, and scholarship interests of University faculty.

CWRSO disseminates two newsletters: *Research Report,* distributed biweekly to faculty, is a newsletter of sponsor information and University policies relating to research; *Target on Research,* distributed weekly to academic units, lists requests for proposals and other one-time solicitations of interest to faculty and administrators.

CENTER FOR SUPERCOMPUTING RESEARCH AND DEVELOPMENT

The Center for Supercomputing Research and Development (CSRD), a special unit of the Graduate College, is involved with advancing the state of supercomputing in three areas: (1) engineering and architecture, (2) software, and (3) algorithms and applications. The primary goal of the CSRD is to demonstrate that supercomputers of the future can exhibit efficient, general-purpose behavior and be easy to use. Activities at the CSRD are based on the algorithm, architecture, and software work conducted at the University of Illinois at Urbana-Champaign for the past fifteen years. The new center was established in late 1984.

Basic research and development at the CSRD will be focused on the Cedar system, a prototype large-scale multiprocessor that is being built at the center. Cedar will be used to explore multiprocessor

performance, develop software to exploit shared-memory multiprocessors effectively, and provide high performance over a wide range of applications.

Engineering and Architecture

In the realm of engineering and architecture, methods are being developed to construct a communication structure (switch) that can support the data transfer, interprocessor communication, and process synchronization requirements of a large-scale multiprocessor. To support a very large number of fast processors, the communication structure must be scalable technologically and architecturally. Research will also be conducted to determine optimal methods by which the control of a multiprocessor can be fully distributed (global). A third major area of research involves the development of the most appropriate methods for synchronizing processes, processors, tasks, and computations for a variety of specific applications.

Software

Extensive experimentation into compilation techniques for a vector/multiprocessor are continuing at the CSRD. The Parafrase System, which provides automatic vectorization and multiprocessing of programs, has been implemented. Software research is also continuing in the management of cache and virtual memory in multiprocessors. By separating "safe" memory accesses from those that would cause cache incoherency and restructuring the program to minimize "unsafe" references that would bypass the cache, the project is designed to demonstrate that a significant advantage can still be gained from the use of caches. Another focus of software investigation will address operating system problems, such as scheduling and queue access, which can result from the use of a large number of processors.

Algorithms and Applications

Numerical algorithms for solving important problems in nuclear reactor safety studies, such as obtaining energy by controlled fusion, atmospheric modeling, and hydrodynamic simulation, have taxed the capabilities of existing computers to the limit. The availability of vector machines such as the Cray and Cyber 205 resulted in some speedup, but for many applications, it has not been substantial. At the CSRD the foundation has been laid for the development of basic multiprocessor algorithms that are counterparts of well-developed and well-understood sequential algorithms. Cedar will provide the opportunity to understand the limitations of certain algorithms as the number of processor clusters increases and will assist in the

development of algorithms that are more suitable for massive parallelism.

In the early 1980s, multiprocessing has begun to emerge as a commercially viable approach to cost-effective, high-speed computation. The Cedar system being built at the CSRD will play a key role in the forefront of these activities. These clusters are interconnected to a single, systemwide memory. To reduce risk and minimize delays, basic hardware to be used in the initial system has been purchased from Alliant Computer Systems. The systemwide memory and interconnection hardware is being designed and fabricated at the center. Two clusters of eight processors became available in 1985. These will be interconnected in 1986, and Cedar will grow to sixty-four processors by the end of 1987. The center's goal is to double the performance of the system every year for the indefinite future.

NATIONAL CENTER FOR SUPERCOMPUTING APPLICATIONS

The National Center for Supercomputing Applications (NCSA), a special unit of the Graduate College at the University of Illinois at Urbana-Champaign, is one of four centers funded by the National Science Foundation (NSF) in February 1985 to start a new, national supercomputing program for university researchers. The NCSA is developing a comprehensive computing environment, centered on a CRAY X/MP supercomputer, to support the research and educational needs of the national user community. Use of the NCSA systems is awarded either by the NSF or through the NCSA Peer Review Board. A graduate student gains access through his or her adviser or a group that has been allocated time on the system.

Primarily the NSF placed the new national centers in major research universities to provide a fertile ground for the multidisciplinary interactions needed to create new fields in computational science. The University of Illinois at Urbana-Champaign has founded an Interdisciplinary Research Center (IRC) within the NCSA to focus this process. The IRC is a new type of scientific institute built around a comprehensive, integrated computational network that facilitates frontier research and the sharing of knowledge across disciplines.

The IRC houses a diverse mix of researchers drawn nationally from the physical, engineering, social, and life sciences. These researchers work together with computer scientists and computer professionals. The center does not directly fund research projects but provides the environment in which they can be carried out effectively. The center is a training ground for graduate students working on IRC-affiliated projects. Training includes not only the use of the supercomputer but also the use of workstations and of

productivity software for research purposes. In addition, the center sponsors many educational activities open to the entire University community, such as seminars and technology demonstrations.

The NCSA approach is to develop a computing system based on proven technologies, while providing an upgraded path to keep the system at the state-of-the-art. In keeping with this approach, the system is based on the CRAY X/MP series of supercomputers by running the interactive operating system, CTSS. The center currently has a CRAY X/MP 24 with two processors and 4 million words of memory. Coupled to the CRAY is a solid-state storage device (SSD) that provides 32 million words of very high speed disk memory. A substantial amount of magnetic disk memory is also available. This system is networked at 50 megabits per second to a 55-gigabyte mass storage system and various high-quality output devices. The CRAY will be upgraded in late 1986 to an X/MP 48 and then eventually to a sixteen-processor system. Memory and storage capacity will be expanded substantially. This final configuration should have a throughput for many applications in the range of 50 to 100 times that of a CRAY 1.

The Interdisciplinary Research Center of the NCSA has a state-of-the-art networked workstation designed to meet the needs of different researchers. Low-end workstations can be used for preparing programs for submission to the CRAY, for displaying results from the CRAY, for preparing documents, and for communication with other users. High-end workstations with high-resolution color displays, a variety of languages and programming tools, mathematical and statistical packages, and general and engineering graphics software can be used for sophisticated pre- and post-processing. This networked workstation environment is designed to enhance research productivity and give faculty and students experience with state-of-the-art tools and techniques in computing.

COMPUTING SERVICES OFFICE

The Computing Services Office (CSO) on the Urbana-Champaign campus provides support for all academic and research programs in which computers play a significant role. To meet this broad objective, CSO operates four general-purpose computers, a large CDC CYBER 175, a CYBER 174, an IBM 3081, two IBM 4341s, and several UNIX systems. These systems are interconnected and serve a network of RJE facilities, public terminal sites, and dial-up terminals. CSO operates sites around the campus as well as serves private facilities. Recent additions include fifty personal computers and color graphics equipment.

Administration of computing facilities is guided by the principle that users should have easy access to computer support. Access to the system is provided through formal allocations for courses and research, and through a "limited free access" policy for students. In addition to its own facilities, CSO arranges access to other computers within the University.

CSO also serves as manager of an NSF sponsored CRAY X/MP 24 supercomputer facility. This is available to University faculty and students through a national allocation process.

Members of more than 100 University departments use CSO facilities. The graduate curricula are heavily dependent on computing support, and a large percentage of dissertations require some computer use. Approximately two-thirds of the utilization is related to graduate programs and research. Unusual areas of strength include computer music and computer art, in addition to those in more quantitative disciplines.

CSO offers a full complement of computer-related user services, including consulting on systems, packages, and hardware. Support services in keypunching, hardware maintenance, and text processing are also available on a limited basis.

The primary facility, CSO North, is situated in the Digital Computer Laboratory and houses the various computers and most of the CSO offices. Nearby systems consultants offer a wide range of services ranging from a walk-in consulting office to short courses and seminars.

A second major facility, CSO South, is situated in the Commerce Building (West). It consists of an IBM 4341 with terminals, terminals connected to other major systems, and a statistical consulting office. Three major facilities staffed by students are situated in residence halls.

The long tradition of computer use at Illinois has led to widespread strength both within CSO and across the campus, and CSO provides general support to keep the University in the forefront in areas where computing is important.

COMPUTER-BASED EDUCATION RESEARCH LABORATORY

PLATO, a unique computer-based educational system, was developed in the Computer-based Education Research Laboratory (CERL) on the Urbana-Champaign campus. PLATO is an interactive, time-sharing system whose computers control 1,400 terminals situated throughout the country. Two Cyber 170-series computers, each with 131,000 sixty bit words of central memory, are the heart of the system. The system also includes 4 million words of extended memory (40 million characters), plus approximately 3.5 billion characters of permanent storage available to users at any time.

The original PLATO terminals used plasma panels for visual display. Several kinds of computer terminals, however, are now used on the CERL PLATO system. The plasma panels and the computer-to-terminal communication scheme were developed at CERL, as were the terminals and other devices such as touch panels and audio. Although the computers are dedicated to educational use and provide teaching facilities for over 1 million hours of student and author use per semester, hardware and software research continues in the laboratory. Opportunities are available for research in designing terminals and communication devices, as well as in developing the delivery of PLATO materials to cable television and to recent system configurations such as Cluster and the new super-sized, more affordable version of the PLATO system.

CERL also cooperates with faculty in many departments who wish to develop courseware for the system and to incorporate it in their instruction. There are approximately 400 PLATO terminals on the Urbana-Champaign campus, more that 250 of which are available for student use. Individualized instruction on the PLATO system with immediate and rapid feedback is offered in many campus courses for undergraduate and graduate students. Lessons now exist in more than 100 subjects. The PLATO system also plays a role in the recreational life of the campus with its variety of interesting games and is a fascinating communication device providing electronic mail service and immediate message exchange between users. At least 8,000 students per semester are involved with PLATO.

In addition to the University of Illinois at Urbana-Champaign PLATO system, there are many other PLATO systems not only in the United States but worldwide. Lessons for the PLATO systems are transferable from one system to another. The courseware is written in TUTOR, a powerful and efficient language originally created for the CERL PLATO system, which allows designing, programming, and testing of lesson materials by the authors directly at their terminals. The PLATO computers are dedicated to teaching, but the system is also used for scientific computation, information retrieval, word processing, data processing, and personal services.

BIOTECHNOLOGY CENTER

The Biotechnology Center, a special unit of the Graduate College, is an organization of eighty members of the Urbana-Champaign campus from more than a dozen disciplinary departments who have active research programs that span a broad range of biotechnology research areas. The center supports an expanding industrial affiliates program which promotes interaction between faculty and scientists in industrial research settings.

Within the Biotechnology Center are two service facilities: the Genetic Engineering Facility and the Cell Science Laboratory. The Genetic Engineering Facility synthesizes peptides and DNA oligonucleotides and performs protein sequencing and amino acid analysis for faculty and for industrial affiliates. The Cell Science Laboratory has a hybridoma facility for making monoclonal antibodies and a flow cytometry facility with three state-of-the-art fluorescence-activated cell sorters. The flow cytometer-cell sorters are available to all faculty members and graduate students for use in conjunction with their research efforts. A full-time operator is available to run samples and to train staff in the use of these sophisticated instruments.

The Biotechnology Center has supported an interdisciplinary graduate course in biotechnology and organizes an annual conference on biotechnology research held each spring on the Urbana-Champaign campus.

COMPOUND SEMICONDUCTOR MICROELECTRONICS CENTER

The Compound Semiconductor Microelectronics Center is organized to provide an interdisciplinary research environment to stimulate interaction between faculty, students, and industry in the areas of advanced semiconductor materials, devices, characterization, submicron fabrication, and general semiconductor processing.

A new 50,000 square foot laboratory is being constructed that will provide 10,000 square feet of Class 100 clean space, upgradeable to Class 10. One-half of this space will be devoted to epitaxial crystal growth with full provisions for handling the toxic gases and materials associated with many epitaxial processes. In addition to the usual support services — such as instrument making, glass blowing, and materials processing, the laboratory maintains unique facilities for semiconductor processing, including electron beam and optical lithography, plasma-assisted deposition of oxides and nitrides, reactive ion etching, plasma etching, thermal and electron beam evaporation, sputter etching and deposition, ion milling, and so on for compound semiconductor device and integrated circuit fabrication. Also available are complete facilities for X-ray, optical, and electrical characterization of semiconductor materials. The Compound Semiconductor Microelectronics Laboratory includes four special subcenters of expertise, or facilities: the facility for submicron fabrication mentioned previously; a facility for artificially structured materials, including MBE and MOCVD epitaxial growth; a facility for ultra–high-purity semiconductor analysis; and a facility for ultra–high-speed electrical and optical measurement.

AGRICULTURE

The College of Agriculture is a broadly based organization with a number of missions that continue to be developed after more than a century of service. These relate to commercial agriculture and include environmental concerns and preservation of our natural resources and the improvement of the quality of life in both home and community. Much of the work of the college is designed to open new opportunities by searching for solutions to specific problems and to transfer this new knowledge to those who can use it. Its work has application in all parts of society and in all parts of the world.

The college has active programs in four broad areas — teaching; research; extension education and public service; and international agriculture. The college includes the School of Human Resources and Family Studies with four departments, Family and Consumer Economics, Foods and Nutrition, Human Development and Family Ecology, and Textiles, Apparel, and Interior Design; the Division of Nutritional Sciences; and the Departments of Agricultural Economics, Agricultural Engineering, Agronomy, Animal Sciences, Food Science, Forestry, Horticulture, and Plant Pathology. Additionally, students can major in Agricultural Communications, Agricultural Education, and Home Economics Education. More than 10,000 acres of college farmland in all parts of Illinois are used for experimentation. The academic and professional staff numbers more than 1,074, many of whom work in more than one of the four areas of the college mentioned above.

Programs for graduate students in the various departments and the school are described in their sections later in this catalog. Approximately 300 of the college faculty are members of the graduate faculty. About 600 graduate students register each year for work in the college. Approximately 40 to 50 Ph.D. and 125 M.S. degrees are conferred annually. Approximately 2,300 students are enrolled in the undergraduate programs of the college.

The college conducts research through the Agricultural Experiment Station, and graduate students are an integral part of that research. Because research often involves more than one field of study, much of it is conducted in cooperation with other colleges on the Urbana-Champaign campus, with the state surveys situated on the campus (Geological, Natural History, and Water), with the U.S. Department of Agriculture, and with other agricultural colleges. Interdisciplinary research is encouraged in such special areas as crop and animal production and uses, environmental quality, pest management, the International Soybean Program (INTSOY), and food and nutrition. Financial support for research comes from appropriations by the

State of Illinois, from federal appropriations and contracts, from international agencies, and from private gifts and fellowships.

Student interest and requests for information and assistance demonstrate that Illinois education, agriculture, and agribusiness are in the forefront of world food production and development. In the future, many students will go into the world employment market, directly or indirectly, even if they live and work in the United States. Several courses in the departments of the college emphasize international agriculture; research is conducted with the goal of assisting developing countries to expand their own capability for food production and distribution. Faculty exchanges and cooperative research with foreign institutions and agencies offer opportunities for mutually beneficial programs. The broad supervision of the college's international activity is in the Office of International Agriculture. Some major international interests in the College of Agriculture include soybeans, maize, animal agriculture, and nutrition.

The college's extension education work is through the Cooperative Extension Service, which has a staff of state, regional, and county specialists in 115 offices throughout the state. The Cooperative Extension Service has 542 academic and professional staff members and about 525 paraprofessionals and other support personnel.

The College of Agriculture is in the final year of a 10-year major development program in buildings, land, and equipment called Food for Century III. This program calls for new building projects, acquisition of land for research and major pieces of fixed equipment, and development of research and extension facilities in northern, southern, and western Illinois. The Orr Agricultural Research and Demonstration Center in western Illinois was established in 1979, and the Agricultural Engineering Sciences Building was completed in 1983. The Northwestern Illinois Agricultural Research and Demonstration Center near Galesburg was established in 1981. Construction of a major plant sciences greenhouse/headhouse complex will begin in the spring of 1986. Planning is also underway for renovation and a major addition to the Animal Sciences Laboratory.

APPLIED LIFE STUDIES

The College of Applied Life Studies is composed of three departments: Health and Safety Studies, Leisure Studies, and Physical Education; two divisions: Rehabilitation Education Services and Campus Recreation (see Resources, Facilities, and Services); and an interdisciplinary research institute, the Institute for Child Behavior and Development.

The mission of the Department of Health and Safety Studies is to

expand knowledge in promoting human health and safety through research, instruction, and service in an interdisciplinary environment attentive to state, national, and international concerns. It includes programs which will enable graduates to undertake research in health and safety education, community health development, health policy, health behavior, safety factors, and epidemiology and to serve as professionals in the health field. Research facilities in the department include a general-purpose resource laboratory, a multiple-car driving range, and community-based field sites.

The Department of Leisure Studies has as its central focus a concern for leisure behavior; its goals are to improve the understanding of leisure behavior and the quality of leisure service delivery systems. The primary research objectives of the Leisure Behavior Research Laboratory are to acquire knowledge about leisure behavior from the social-psychological and sociological perspective and play and movement behavior of children and adults in leisure-time activities. The laboratory also studies leisure of the handicapped and other special populations.

The Office of Recreation and Park Resources (ORPR) is the designated service unit of the department. ORPR was merged with the Cooperative Extension Service of the College of Agriculture, offering consultation services, conducting research and continuing education, and serving as a laboratory for carrying out sound recreation research programs in cooperation with other disciplines within the University and throughout the state. The four major program and research areas served by specialists are: community recreation, outdoor recreation, personnel development, and therapeutic recreation.

The Department of Physical Education is committed to the study of the bioscientific, social scientific, and educational aspects of human movement, physical activity, and sport. Major areas of investigation include biomechanics, motor learning, physiology of human performance, psychology of sport, sociology of sport, and administrative and curriculum studies related to physical education and sport programs for both normal and atypical populations. The department maintains several research facilities, including the Biomechanics Laboratory, the Exercise Therapy Clinic, the Motor Behavior Laboratory, the Physical Fitness Laboratory, and the PDP 11/03 computer facility interfaced with each research laboratory.

The Institute for Child Behavior and Development, an interdisciplinary center, has established a national reputation for its work in the following areas: gerontology, motivation, psychopharmacology,

school achievement assessment, and test anxiety in schools. The institute is in the process of expanding its mission to embrace research studies that cover the entire human lifespan.

COMMERCE AND BUSINESS ADMINISTRATION

The College of Commerce and Business Administration offers graduate work in the Departments of Accountancy, Business Administration, Economics, and Finance. The professional degrees, Master of Accounting Science (M.A.S.), Master of Business Administration (M.B.A.), the Executive M.B.A., and Master of Science in Business Administration (M.S.B.A.), are offered in addition to the masters' degrees and doctoral degrees in each of the departments.

Joint degree programs include the J.D. and M.A.S., M.A.S. and Bachelor of Arts in Liberal Arts and Sciences, M.A.S. and Bachelor of Science in Computer Science, J.D. and M.B.A., M.B.A. and Master of Architecture, M.B.A. and Master of Computer Science, M.B.A. and Master of Electrical Engineering, M.B.A. and Doctor of Medicine, M.B.A. and Bachelor of Arts in Liberal Arts and Sciences, M.B.A. and Research Management, M.B.A. and Master of Arts in Public Administration, and Master of Science and Master of Architecture.

Although the lecture-discussion form of teaching is widely used in the college, the faculty utilizes a variety of other resources. Organization theorists use the Behavioral Laboratory for evaluating the small-group–decision-making process. The computer is widely used in teaching accounting, statistics, and operations research. Many cases and simulation programs and games in business administration and finance courses depend on the computer to generate analytical information. Also, many courses involve students in writing computer programs or using the large library of computer programs for research.

An important development in the college is the new Office of Information Management, financed jointly by a grant from the IBM Corporation, college and university funds, and other corporate donations. The major goal of the office is to coordinate the development of computer applications in the course curriculum, to supervise computer laboratories used for general student projects which simulate specialized business information system environments, and to provide a focal point for research related information systems and their impact on management and its operations. This permits the college to give students experience in state-of-the-art equipment and programs in information systems.

Faculty and students rely heavily on the outstanding University Library, which has a large collection of books, reference documents,

serials, periodicals, and company data. The Executive-in-Residence Program and the Executive Lecture Series bring visiting business executives to the campus to present lectures and lead discussions on specific topics.

The Bureau of Economic and Business Research provides and analyzes a variety of state and local economic data. The college has acquired several financial data files such as the Chicago Research on Stock Prices (CRSP), the Federal Trade Commission Quarterly Financial Standard, the Duff and Phelps Investment Research Files, and Poor's Compustat Tapes. There are also economic data tapes, including Citibank tapes, and the college is the depository for the Bureau of Economic Analysis tapes.

Another important aspect of the college's overall teaching and research program is the international orientation of many programs. Distinguished faculty members with international academic backgrounds have developed a number of special courses with an international focus. The Office of the Coordinator of International Programs in the college provides overall assistance in the international field. The Center for International Education and Research in Accounting in the Department of Accountancy coordinates the research programs of distinguished visiting scholars and publishes an international accounting journal. The college is involved in several overseas international programs, including programs in Bangladesh, Saudi Arabia, the Sudan, and elsewhere. A Program in Policy Economics has been started in the Department of Economics for people from developing countries.

The Office of Real Estate Research, funded by the State of Illinois' Real Estate Recovery Fund, undertakes and fosters research related to real estate in Illinois, communicates the results of such research to the real estate industry, and promotes the ongoing development of real estate education.

Three new research offices have been created in the college. They are: the Office of Public Utility Research; the Office of Accounting Research; and the Office of Innovation, Entrepreneurship, and Economic Development. Each of these offices promotes and coordinates research of faculty members in the college in these specific areas. In addition, each office provides a focal point for the college and its various constituencies to discuss and disseminate ideas in research results. These offices are funded by a combination of government and private industry support.

The Survey Research Laboratory is widely used by faculty and students interested in survey work. The Behavioral Laboratories are used to perform a variety of behavioral experiments, and the computer is a major tool for hypothesis testing and programming.

COMMUNICATIONS

In the College of Communications, the Institute of Communications Research, which administers the doctoral program in communications, is a pioneer interdisciplinary center that investigates virtually all aspects of human communication. It provides students the opportunity to study and to conduct research with a faculty that joins such disciplines as political science, sociology, psychology, and linguistics with the professional fields of advertising, broadcasting, and journalism. The University broadcasting division, which operates WILL-AM-FM-TV, provides equipment and studios for broadcast instruction. The college also maintains laboratories for audio production, typography, and photography. Holdings in the Communications Library in Gregory Hall are widely regarded as the best in the nation.

EDUCATION

The College of Education is recognized worldwide for the excellence and leadership of its faculty, graduate programs, and alumni. During the past decade, the college has consistently been rated among the top five colleges of education in the nation. Its faculty have served as executive officers of nearly every professional education organization and also have held editorial and review positions on most educational journals. Seven major professional journals are currently published under the auspices of the college. Typically, more than forty percent of the college's budget results from externally funded research.

College alumni are found in faculty and administration positions in the leading colleges of education throughout the world. Additionally, alumni hold numerous leadership positions in government education agencies and school districts.

Graduate programs are offered in all of the academic departments: Administration, Higher and Continuing Education; Educational Psychology; Elementary and Early Childhood Education; Educational Policy Studies; Secondary Education; Special Education; and Vocational and Technical Education.

The Department of Administration, Higher, and Continuing Education has three divisions that offer research and professional programs with humanistic and social science foundations and theoretical and practical perspectives. The Division of Educational Administration and Supervision emphasizes scholarship and research in areas such as school law, supervision and evaluation of instruction, school finance, politics of education, the nature of school excellence, and administrative theory. The Division of Higher Education prepares degree candidates for administrative positions in community and

senior colleges, universities, and related agencies. It provides specializations in the administration of higher education, student development, student affairs, and the history of higher education. Persons enrolled in the Division of Continuing Education are prepared for administrative positions in a variety of continuing education agencies concerned with professional development.

The Department of Educational Psychology serves two primary interrelated functions. The first is to promote both basic and action-oriented psychological and other types of research on questions related to broadly used educational practices and policies. The second is to train practitioners, including in-service and preservice instruction and consultation. Graduate degrees are offered in areas covered by its five divisions: Counseling Psychology, Human Development, Learning and Instruction, Quantitative and Evaluative Research Methodologies, and Sociocultural Perspectives in Education. Also, a master's degree can be earned in a general educational psychology program. The department has a national and an international reputation as a research and educational center.

The Department of Educational Policy Studies is composed of three divisions: History of Education, Philosophy of Education, and Comparative Education and Social Science. The department offers programs for training scholars, teachers, and educational policy analysts. The programs provide a basis for analysis and evaluation of educational theory, practice, and policy within the intellectual and empirical contents of history, philosophy, and the social sciences.

Graduate degree programs in the Department of Elementary and Early Childhood Education are designed to meet the individual needs of college graduates who are prospective or experienced teachers, administrators, or consultants working in the field of education. Areas of graduate specialization include Early Childhood Education, Elementary Education, Curriculum, Language Arts, Mathematics, Reading, Science, Social Studies, Teacher Education, and Bilingual Education. Students work closely with faculty members who have national reputations in research, development, and scholarship.

The Department of Secondary Education offers teacher-certification programs in the areas of English, mathematics, science, and social studies and a teacher education minor in computer-assisted instruction. Programs in these areas, as well as in curriculum, curriculum and instruction, and teacher education are offered at all levels of graduate study. There is also an Ed.D. program in music education.

The Department of Special Education offers graduate programs to prepare teachers, supervisors, and administrators of special education for exceptional children in public and private agencies. At the doctoral

level, leadership personnel are prepared for teacher education, research, and administrative positions in university settings and local, state, or national agencies serving handicapped or gifted individuals.

The mission of the Department of Vocational and Technical Education is reflected in its goals: (1) to prepare and upgrade personnel to serve as researchers, teacher-educators, and administrators; (2) to maintain a program of disciplined inquiry, which generates and disseminates new knowledge designed to improve educational practices; and (3) to provide professional services to the department, the University, schools, professional organizations, governmental agencies, and other public and private organizations at local, state, national, and international levels. The programs available in the department are Agricultural Education, Business Education, Health Occupations Education, Home Economics Education, Industrial Education and General Vocational Education.

In addition to research conducted principally within academic departments, the following units, with specialized research interests, are supported by the college: The Bureau of Educational Research, The Center for Instructional Research and Curriculum Evaluation, The Center for the Study of Reading, the Curriculum Laboratory, the Office of Educational Policy Research, the Office of International Programs in Education, the Office of Multicultural Bilingual Education, the Office for Career Development for Special Populations, the Office for School Research and Improvement, the Office of Vocational Education Research, and the Secondary Transitional Intervention Effectiveness Institute. Most of these units offer assistantships or fellowships to qualified doctoral students.

ENGINEERING

One of the original units of the University when it was founded in 1867, the College of Engineering is recognized as a major international center of excellence in graduate education in scope, quality, and productivity. In overall quality, the college has been among the top four in the nation in all surveys of recent years. The College of Engineering leads the nation in total degrees conferred at all degree levels; in recent years, one out of every twenty Ph.D. graduates in engineering received his or her degree from the University of Illinois at Urbana-Champaign.

The college's Engineering Experiment Station, organized in 1903 as the first of its kind, had separately budgeted research expenditures in the 1984 fiscal year of $43 million. Special laboratories and unusual facilities such as the nuclear reactor, radio and optical telescopes, AVCO HPL-10 20-kW industrial laser, and an 80-kW plasma spray

unit are available. University computer services are provided by a number of general purpose computers; a large CDC CYBER 175, a CYBER 174, two IBM 4341s, and several VAX 11/780s. The College of Engineering operates an IBM 4381 for VLSI work, an IBM 4341 dedicated to CAD/CAM, and numerous VAX 11/780s, as well as Harris 800s, Pyramids, HP 9000s, Symbolics, and an AT&T 3B20-based system. Much of this equipment is linked via ethernet. The Engineering Library holds 175,000 volumes and more than 3,500 periodical subscriptions. It is supplemented by a series of departmental libraries including mathematics, physics, chemistry, and geology.

The departments of the college offer graduate degree programs in aeronautical and astronautical, ceramic, civil and environmental, electrical and computer, mechanical and industrial, metallurgical, and nuclear engineering, and in computer science, physics, and theoretical and applied mechanics. Interdisciplinary specialities include bioengineering, engineering design, environmental control, and materials engineering.

The college maintains two major interdisciplinary research laboratories: the Coordinated Science Laboratory (CSL) and the Materials Research Laboratory (MRL). CSL provides an interdisciplinary research environment for faculty and students from engineering as well as other disciplines. MRL, with one of the outstanding facilities for electron microscopy in the United States, supports research and education in the materials sciences in cooperation with a number of engineering and scientific disciplines; multidisciplinary research basic to an understanding of the solid state of matter is stressed. Both laboratories maintain special facilities and shops to promote their programs of investigation. New centers are emerging in microelectronics, composites, and polymers.

The campus' two supercomputing centers, while special units of the Graduate College, have a close association with the College of Engineering. The Center for Supercomputing Research and Development is involved with advancing the state of supercomputing in three areas: engineering and architecture, software, and algorithms and applications. The National Center for Supercomputing Applications is one of the premier national centers created by the National Science Foundation in 1984 to provide supercomputers in major U.S. research universities. With a Cray X/MP 24 with two processors and 4 million words of memory, it is a major basic research facility. The Materials Engineering Research Laboratory is an interdisciplinary laboratory with extensive equipment for the characterization of the mechanical behavior of materials.

FINE AND APPLIED ARTS

The College of Fine and Applied Arts includes the Departments of Dance, Landscape Architecture, Theatre, and Urban and Regional Planning, and the Schools of Art and Design, Architecture, and Music. The "research" resources for these departments are also the cultural resources of the campus described in another section of this catalog. The Krannert Center for the Performing Arts provides studio space for classes in theatre, dance, and music; graduate students participate in many of the public performances in its four theatres. Students in the School of Art and Design have an annual exhibition of their work in the Krannert Art Museum, which is connected to the Art and Design Building. The work of architecture students is exhibited in the Temple Buell Architecture Gallery.

Many visiting artists, performers, and speakers are brought to the campus under the auspices of the college and its departments. Special libraries in art and architecture, city planning and landscape architecture, and music serve students and faculty in the fine and applied arts.

LAW

The College of Law offers graduate training in all areas of its curriculum. The emphasis for graduate lawyers from the U.S. and from Commonwealth countries, whose legal system is based on the common law, is to provide advanced training in preparation for a career in teaching or specialized practice. A substantial program in international legal studies affords opportunities for both U.S. graduates and foreign lawyers to select from a wide variety of advanced courses, and to engage in research dealing with all phases of international transactions. The main geographic focus of the international legal studies program has been on the legal systems of Latin America and of Western and Eastern Europe.

LIBERAL ARTS AND SCIENCES

The College of Liberal Arts and Sciences is the largest college within a university setting in the state of Illinois. The college provides instruction in a diverse set of fields which encompass most of the traditional disciplines in the liberal arts and sciences. The thirty-eight degree-granting departments and programs in the college offer a total of seventy-two undergraduate, fifty-eight master's, and thirty-seven doctoral degree programs. The graduate instructional programs of the individual departments and units of the college are discussed in the Programs of Study section of this catalog.

The units providing graduate instruction and graduate degrees in the college are listed below:

School of Chemical Sciences
Department of Biochemistry
Department of Chemical Engineering
Department of Chemistry

School of Humanities
Department of the Classics
Program in Comparative Literature
Division of English as a Second Language
Department of English
Department of French
Department of Germanic Languages and Literatures
Department of History
Department of Linguistics
Department of Philosophy
Religious Studies Program
Department of Slavic Languages and Literatures
Department of Spanish, Italian, and Portuguese
Department of Speech Communication

School of Life Sciences
Department of Anatomical Sciences
Department of Ecology, Ethology, and Evolution
Department of Entomology
Department of Genetics and Development
Department of Microbiology
Department of Physiology and Biophysics
Department of Plant Biology

Other Departments and Units
Center for African Studies
Department of Anthropology
Department of Astronomy
Center for East Asian and Pacific Studies
Department of Geography
Department of Geology
Center for Latin American and Caribbean Studies
Department of Mathematics
Department of Political Science
Department of Psychology
Center for Russian and East European Studies
Department of Sociology
Department of Speech and Hearing Science
Department of Statistics

Most of these units have prepared brochures and materials describing, in greater detail than is possible here, the resources and facilities available for graduate students, research efforts, and graduate instruction. The reader should contact the unit in which he or she is interested to obtain further information. The following is a brief description of the major kinds of resources and facilities available to students in units of the college. The specific resources described are only examples of those available in each category.

School and Departmental Libraries

A number of units in the college have exceptional departmental libraries conveniently located near the units. In particular, as men-

tioned on page 18, the libraries in chemistry, life sciences, and mathematics are exceptional. A number of the collections for the humanities and social sciences are outstanding, for example, the Slavic collection, the Asian Library, and the map and geography library. (See pages 17 and 18.)

Museums and Collections

There are two particular resources administered by departments in the Life Sciences: the Herbarium and the Museum of Natural History. The Herbarium is the tenth largest herbarium situated at an American university. It is both a research and teaching facility and its staff serves the public by assisting in the identification of plants.

The Museum of Natural History has served students in graduate research and faculty members since the 1870s. A number of special collections, including reptiles, amphibians, mammals, and shells from all parts of the world, are housed in the museum. Research specimens for advanced scientific study number over 400,000.

Two collections of special note in the humanities are the American Center of the International Photographic Archive of Papyri and the Cinema Studies Film Archive.

The World Heritage Museum houses more than 25,000 artifacts that illustrate cultural achievements from prehistoric Europe; ancient Mesopotamia, Egypt, Greece, and Rome; Northern Europe; Africa; the Orient; and America. The museum's collections are heavily used by University classes in history, art history, classics, and anthropology for general tours and individual research projects.

Clinical and Training Facilities

The Department of Psychology operates the Psychological Clinic which is the principal facility for training and research in clinical psychology. The Department of Speech and Hearing Science operates three clinics to provide training for its students (speech, language, and hearing clinics). The Department of Astronomy operates, in conjunction with San Diego State University, a one-meter optical telescope at Mt. Laguna in California for training and research purposes; in addition, the department arranges for observation time for students on both optical and radio telescopes at other sites.

Laboratories

All of the units in the life sciences, the physical sciences, psychology, and speech and hearing science have extensive laboratory facilities. Of particular note are the facilities of the School of Chemical Sciences and the Center for Electron Microscopy. In addition, there are two outstanding laboratories in the humanities and social sciences: the

Language Learning Laboratory in the School of Humanities and the Spatial Data Analysis Laboratory in the Department of Geography.

The technical facilities of the School of Chemical Sciences include molecular spectroscopy, mass spectroscopy, and laser spectroscopy laboratories; a radioisotope laboratory; a computer center; a microanalytical laboratory; hydrogenation and high-pressure facilities; and machine, electronic, electrical, and glass-blowing shops.

The Center for Electron Microscopy is a campus facility designed to meet the instructional and research needs of faculty and graduate students from all scientific areas on campus and is involved with developing new instructional and research techniques in electron microscopy. The center's instructional program is among the largest and most varied in the nation, providing a number of specialty courses. In addition to electron microscopes, the center has a laboratory equipped for state-of-the-art freeze fracturing and cryoultramicrotomy, a computerized digitizing system for the morphometric analyses of electron micrographs, and a number of ancillary equipment items for microtomy, vacuum evaporation, freeze and critical point drying, and light microscopy. The major equipment includes three transmission electron microscopes, three scanning electron microscopes, and an automated microprobe operated in conjunction with the Department of Geology, which provides both the highest resolution scanning and transmission electron microscopes currently available for research use.

The Language Learning Laboratory (LLL), in addition to providing teaching facilities, promotes research in language learning and teaching. Advanced technological resources, including PLATO, CYBER, microcomputers, and television production facilities are available for the LLL.

The Spatial Data Analysis Laboratory, which is administered by the Department of Geography, is responsible for developing and improving research and instruction related to the acquisition, analysis, and display of spatial data. Technical service facilities (including electronic coordinate digitizers, computer terminals, graphics terminals, darkroom photo-processing facilities, and a remote sensing and air photo laboratory) are available.

Quantitative Services

There are special computing resources available in many departments in the college; at the same time, all units on campus have access to the Computing Services Office (see page 22). For example, the Department of Astronomy has direct access to the VAX 11/780 computer, shared with three other units on campus.

The National Center for Supercomputing Applications will have a

Cray X/MP 24, the fastest commercially available supercomputer, in operation in 1986. The center will provide access to the Cray to researchers from a wide range of fields. It is expected that several of the scientists in the center will also work with students. Further description of the center may be found on page 21.

The Department of Statistics, through the Mathematical and Statistical Consulting Committee, provides a consulting service to faculty and graduate students from all areas of the University. The service provides assistance in design and analysis of various statistical projects.

Interdisciplinary Research Efforts

Units in the college participate in a number of campuswide interdisciplinary efforts, many of which are described elsewhere in this catalog. Some of the instructional units in the college are by nature interdisciplinary. The area studies centers (African Studies, East Asian and Pacific Studies, Latin American and Caribbean Studies, and Russian and East European Studies) are examples of these; their degree programs are described in the Programs of Study section. There are two special units within the School of Humanities which are of note: the Unit for Cinema Studies and the Unit for Criticism and Interpretive Theory.

The Unit for Cinema Studies promotes and coordinates the critical and historical study of the cinema. Its membership represents several departments and reflects a variety of critical and scholarly interests. The unit is also a resource center which promotes cinema teaching and scholarship through its growing archive of film materials and its editorial and analytical equipment for film study.

The Unit for Criticism and Interpretive Theory, an interdisciplinary program drawing upon fifteen humanities and social science departments, promotes a broad range of teaching, research, and related scholarly activities. For A.M. and Ph.D. degree students in participating departments, the unit offers a formal program leading to advanced certification in criticism and interpretive theory.

There are a number of other groups (some informal) of faculty and students working together on interdisciplinary studies. Examples of these are the Afro-American Academic and Research Program; the Program in Arms Control, Disarmament and International Security; the Science, Technology and Society Program; the Southwest Asia Studies Program; and the Office of Women's Studies.

Scholarly Journals

A number of major scholarly journals are edited in units within the college; among these are *Comparative Literature Studies, Illinois Classical Studies, Journal of English and Germanic Philology,* and *Illinois Journal of Mathematics.*

Placement Services

All departments and schools assist their students in seeking placement. In some cases, resources in schools or departments are pooled; the Schools of Chemical Sciences and Life Sciences, and the Department of Mathematics have each organized central placement services. Other units have their own placement programs or assist students individually. Also, the School of Humanities has a graduate intern in the campus Career Development and Placement Office to assist students.

VETERINARY MEDICINE

The graduate programs in the College of Veterinary Medicine emphasize research training involving animal health, infectious and metabolic diseases, zoonotic diseases, public health, biotechnology, and comparative medicine. The college has new, modern clinical and basic sciences facilities for graduate study and research ranging from basic biotechnology to applied clinical and field studies under controlled confinement and natural environmental conditions. Major emphasis is being placed on graduate training in biotechnology. Interdisciplinary research is ongoing with other colleges on the Urbana-Champaign campus and at the Dixon Springs Agricultural Center in southern Illinois. The college's association with the Illinois State Department of Agriculture, Department of Public Health, and Department of Conservation provides opportunities to utilize field facilities for appropriate research projects.

RESOURCES, FACILITIES, AND SERVICES

CULTURAL RESOURCES

The University of Illinois at Urbana-Champaign provides the campus community with a broad spectrum of cultural resources. The four theatres of the Krannert Center for the Performing Arts, the Assembly Hall, and other facilities on the campus present a diversity of events in music, theatre, dance, and cinema usually found only in large metropolitan centers. There are well over 500 public performances each year covering the entire spectrum of the performing arts. Internationally known professional performers are brought to the campus to augment the offerings of the Departments of Theatre and Dance and the School of Music.

The Krannert Art Museum has a full schedule of exhibitions, both from its own collection and traveling exhibitions. The Festival Gallery in the Krannert Center for the Performing Arts brings to the campus a series of one-man shows of the work of contemporary artists. The World Heritage Museum, the Natural History Museum, and the John Phillip Sousa Museum and Library serve the purposes of research, teaching, and enjoyment. The Temple Buell Architecture Gallery provides for the exhibition of student work in architecture and related areas of study.

The Japan House provides members of the campus community an opportunity to experience the teaching of Japanese arts in a realistic environment.

Distinguished public figures and outstanding scholars appear regularly on campus for symposia, lectures, forums, and public discussions.

WILL-TV and AM-FM radio station, all affiliated with the Public Broadcasting Service, provide a wide range of cultural programs to a large area of the state.

The Illini Union, the campus social center, offers lounges, dining facilities, and recreational and meeting rooms for individuals and

groups. Special events are scheduled throughout the year. The Illini Union Gallery provides exhibits of a broad range of contemporary art and craft objects. There are many cultural opportunities in the community. For information about these, contact the Champaign County Arts Council.

RECREATIONAL FACILITIES

The University of Illinois is the home of one of the top collegiate recreational sports programs in the nation, the Division of Campus Recreation (DCR). All sectors of the University can and do participate in the multifaceted recreation programs sponsored by the division, a service unit of the College of Applied Life Studies.

Recreational programs and services include excellent facilities, special events, outdoor recreation, sports clubs, intramurals, exercise and fitness programs, Ice Arena activities, and student leadership and employment opportunities.

One of the most popular recreational areas on campus is the Intramural–Physical Education (IMPE) Building on Peabody Drive. This facility contains multipurpose gymnasiums, indoor and outdoor swimming pools, handball/racquetball and squash courts, and outdoor tennis courts. There are also weight training and exercise rooms, an archery range, a golf driving and putting room, a games room, and offices.

The Ice Arena, 406 East Armory, is open from October to April for various activities, including skating, hockey, broomball, skating lessons, and parties. The Ice Arena is also available during the non-ice season for indoor soccer, dances, floor hockey, rollerskating, and parties.

Throughout the year, DCR offers diverse programs to appeal to a wide range of interests. These special events include Quad Day, the All-Nighter, Bong Show, Sports Trivia Bowl, Wellness Fair, Almost Anything Goes, concerts, and other activities.

Exercise and fitness programs sponsored by DCR include aerobics classes, Mother-to-Be exercise, water exercise, dance fitness, and the Illini Century Club for self-paced wheelchair pushers, joggers, swimmers, and cyclists.

More than thirty-five different sports clubs provide a variety of activities for students, ranging from martial arts and scuba to rugby and ice hockey. Team and individual sports competition, practice sessions, and tournaments with other universities are possible.

The outdoor recreation program offers opportunities for students to rent camping and sports equipment, including tents, backpacks, and skis. Several outdoor clinics, weekend workshops, and extended

trips to such areas as the Grand Canyon and the Florida Everglades are scheduled during the year.

Approximately forty-five activities are available to students in the organized intramural sports program. Students can participate in men's, women's, co-recreational, and grad/faculty/staff divisions in sports ranging from flag football, soccer, and basketball to tennis, swimming, and wrestling. Novel sports such as innertube water polo, ultimate frisbee, broomball, and wallyball have many enthusiastic participants.

Students may apply for part-time employment and volunteer leadership opportunities. More than 400 students work as intramural sports officials and supervisors, lifeguards, receptionists, designers, first aid supervisors, building supervisors, and intramural managers each year.

INTERNATIONAL PROGRAMS AND STUDIES

The University of Illinois at Urbana-Champaign offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate study and research often form an integral part of University programs with foreign institutions. Research opportunities are available through many departments, the Graduate College, the Center for African Studies, the Center for East Asian and Pacific Studies, the Center for Latin American and Caribbean Studies, the Center for Russian and East European Studies, the Program in South and West Asian Studies, and the Office of West European Studies.

For full information on these opportunities, as well as other graduate study-abroad programs and a wide range of courses and seminars in international studies, write for the handbook *International Programs and Studies at the University of Illinois at Urbana-Champaign,* obtainable from International Programs and Studies, 324 Coble Hall, 801 South Wright Street, Champaign, IL 61820, or contact the appropriate college or department.

In addition, overseas teaching opportunities are often available in music education, English as a second language, and some of the modern language departments. Interested students should consult the executive officer of the appropriate department or division.

CIC TRAVELING SCHOLAR PROGRAM

The Committee on Institutional Cooperation, a consortium of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its effort to increase cooperative use of its member institutions' resources. The program

enables doctoral-level students to attend other CIC institutions in order to take advantage of special course offerings, laboratory facilities, or library collections. Visits of traveling scholars are limited to two semesters or three quarters. Traveling scholars register and pay regular fees at their home universities. Credit earned while in this program is automatically accepted by the home university.

Application forms are available from the Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

REHABILITATION-EDUCATION SERVICES

Since 1947 the University of Illinois at Urbana-Champaign has pioneered in facilitating the education of physically disabled students. Campus facilities are among the best in the nation, and applications from persons with physical disabilities are welcomed. The Division of Rehabilitation-Education Services, in the College of Applied Life Studies, which is responsible for planning campus facilities to ensure that all are accessible to and usable by the physically disabled, provides a variety of services and opportunities to physically disabled students. These include early registration privileges, housing arrangements, transportation, prosthetic repair, physical therapy and functional training, occupational therapy, medical services, counseling services, recreation and athletics, and services to the visually and hearing impaired. Applicants are encouraged to make direct contact with the division at the Rehabilitation-Education Center, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, Illinois 61820, (217) 333-4602, for further information.

Since some graduate programs require a variety of physical skills, prospective students with permanent physical disabilities are strongly encouraged to communicate with the division to ascertain how their particular program can be implemented. The division works closely with academic units to establish the manner in which degree requirements can be met.

HOUSING

The University maintains housing for single graduate students in two residence hall areas close to the campus. Double and single rooms are available. Each room is furnished and directly connected with a bathroom shared with the residents of one or two other rooms. Lounge facilities, laundry rooms, and vending machines are located in the buildings. A contract for food service in undergraduate dining rooms may be arranged. Graduate residence hall contracts can be obtained by writing the Residence Hall Contracts Office, University

of Illinois at Urbana-Champaign, 200 Clark Hall, 1203 South Fourth Street, Champaign, Illinois 61820. Contracts are accepted until all available space is filled. Priority in assignment is determined by the date the completed contract and the advance payment is received.

Furnished efficiency one-bedroom and two-bedroom apartments are maintained by the University for married students and students with families. Some two-bedroom units are unfurnished, but all include stoves and refrigerators. For a lease in a University-owned apartment, write to the Family Housing Office, University of Illinois at Urbana-Champaign, 1841 Orchard Place, Urbana, Illinois 61801.

The Housing Information Office also maintains a current listing of privately owned apartments and rooms available in the community. Students seeking private housing are urged to visit the campus as early as possible as all reservations for this type of accommodation should be made in person. In some instances, it may be necessary to make arrangements as much as six months before the opening of the school term. Anyone unfamiliar with standard leasing practices should ask a housing consultant for assistance. The Housing Information Office, University of Illinois at Urbana-Champaign, is located at 2 Fred H. Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820, (217) 333-1420.

The University of Illinois at Urbana-Champaign and the University residence halls are committed to a policy of nondiscrimination with respect to race, creed, color, national origin, ancestry, religion, sex, marital status, age, handicap, unfavorable discharge from the military, or status as a disabled veteran or veteran of the Vietnam era.

HEALTH SERVICE AND INSURANCE

Students enrolled in credit courses who are in attendance on the Urbana-Champaign campus are assessed fees which cover (1) health service at the McKinley Health Center and (2) group health insurance.

Health Service

The McKinley Health Service fee supports the medical services available at the McKinley Health Center, situated on campus. The health center is fully accredited as an ambulatory care facility by the Joint Commission on Accreditation of Hospitals. Dependents are not eligible for care at the health center unless they are also enrolled students on the Urbana-Champaign campus. McKinley Health Center offers five basic medical services: routine office care, acute care for illness and injury, mental health care, women's gynecological care, and health education. These services are available at no additional cost to all students who have paid the health service fee.

Health service physicians provide general medical care and advice while the student is on campus, and students may consult the health service physician of their choice by appointment. The physician can utilize a wide range of diagnostic tests, including laboratory procedures, X-ray examinations, and electrocardiograms. A limited pharmacy provides drugs at no cost for students when they are under the care of a health service physician.

Group Health Insurance

The University Student Insurance Plan provides worldwide hospital-medical-surgical coverage (up to $100,000) for the insured student (and/or dependents) who may choose any legally qualified hospital or licensed physician. The coverage is provided on a semester basis and includes all holidays in the term as well as the period between semesters. Brochures describing the University Student Insurance Plan in detail are available at registration, the Post-Registration Service Center, and at the Student Insurance Office, Window 20, 100 Administration Building, 506 South Wright Street, Urbana, Illinois 61801 (hours: 9 a.m. to 4 p.m.).

Coverage may be purchased for dependents, spouse and children, during regular term enrollment periods. A new spouse or newborn child may be added to the plan within ten (10) days of marriage or birth at any time during the term.

Students may request exemption from payment of the insurance plan premium by presenting evidence of equivalent medical insurance coverage (a copy of the policy or schedule of benefits) and completing a Petition for Exemption. This must be done in person within the period provided for the exemption of fees for the relevant term, either during registration or at the Post-Registration Service Center. Once exempt, the student will automatically be exempt when registering for subsequent semesters.

Students may request reinstatement to the Student Insurance Plan subject to completion of a statement of medical history and approval of the insurance carrier. Reinstatements may be requested at any time during a term.

Students may extend coverage for one term following graduation or withdrawal from school by making an application and paying the appropriate premium at the student Insurance Office. Coverage for dependents may also be extended, provided those dependents were covered for the previous term. Extension enrollment periods begin

July 15 and continue through the tenth instruction day of the semester to extend for the fall semester; December 1 through the tenth instruction day of the semester to extend for the spring semester; and April 15 through the fifth instruction day of the summer session to extend for the summer.

REQUIREMENTS AND PROCEDURES

ADMISSION AND REGISTRATION

General Requirements

The Graduate College considers for admission only those applicants graduated from an accredited college or university who hold or will be granted by the end of the current academic year a baccalaureate degree (or its equivalent) comparable in content and in number of credit hours with that granted by the University of Illinois at Urbana-Champaign. Also applicants must have an admission average of at least 4.0 (A = 5.0) computed from the last 60 hours of undergraduate work and any graduate work completed. Meeting these minimum admission requirements of the Graduate College, however, does not guarantee admission; individual departments may set a minimum grade-point average higher than that of the Graduate College and may impose other special admission requirements and conditions. Because applicants to most departments compete for a limited number of positions, many who exceed minimum requirements may be denied admission.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses which have a bearing on the student's field of specialization should submit a written evaluation or a letter grade by the instructor in each such course along with scores on the Graduate Record Examination. Because some departments have special examination requirements, applicants should check with their departments; for example, accountancy and business administration use the Graduate Management Admission Test instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in November or December for the summer session and fall semester, and September or October for the spring semester.

Applications will not be accepted during the three weeks preceding the beginning of a term.

Application forms may be obtained from the major department or the Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820. A nonrefundable application fee must accompany the application.

International applicants must submit official records of all higher education, including certificates of degrees with the dates the degrees were conferred. If only one original is available and would be difficult to replace, an attested or certified copy should be submitted. All records not in English must be accompanied by a translated record. Records should show the individual subjects studied and the grades received in each subject.

International applicants are required to submit proof of adequate finances for the entire period of planned study. Applicants unable to provide satisfactory evidence of adequate finances will not be granted admission.

Eligible applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) given several times a year throughout the world. Applicants should make arrangements directly with the Educational Testing Service, Box 899, Princeton, New Jersey 08541, U.S.A. Graduate applicants, however, are exempt from this testing if they have completed at least two academic years of full-time study within five years of the proposed date of enrollment in the University in a country where English is the primary language and in a school where English is the primary language of instruction.

The University requires a score of at least 520 on the TOEFL examination and some departments require higher scores. All nonnative, English-speaking applicants to the Graduate College who are offered admission on the basis of their academic credentials but score below 590 on the TOEFL or fail to submit a required TOEFL score, will be admitted on limited status and required to take the English Placement Test (EPT) upon their arrival.

Notices of Admission

Each student offered admission into a graduate department is admitted as either a degree candidate or a nondegree student. Following admission, the Office of Admissions and Records issues a Notice of Admission to the student. This notice allows the student to begin studies in a specific term; applicants desiring a change in this term of entry are required to file another application and pay an additional processing fee unless the major department formally requests the Office of Admissions and Records to waive these requirements.

Exceptions to this rule are that a Notice of Admission for the summer session not marked "Summer Only" is valid for the following fall semester, and that a Notice of Admission for the fall semester is also valid for the preceding summer session.

Specific conditions of admission may be noted on the Notice of Admission and, when needed, explained further in communication from the major department. Admitted students may be placed on limited status if their preadmission grade-point average is below the Graduate College minimum. Major departments may also admit students on limited status on the basis of other deficiencies. Students admitted on limited status should have a clear understanding with their major department concerning what conditions must be satisfied to qualify for a change from limited to full status. The major department should request the Graduate College Student Records Office to change the student from limited to full status once the specific conditions have been satisfied. No student can receive an advanced degree while on limited status.

The Notice of Admission may also indicate transcripts which are still outstanding. All admitted students are required to provide complete credentials to the Office of Admissions and Records before the beginning of their second term of registration or such registration will not be permitted. Newly admitted students should take their Notice of Admission with them the first time they go through registration.

ENROLLMENT PATTERNS

All campus students enroll in one of two enrollment patterns: (1) continuous — enrollment is expected in the fall and spring semesters with summers optional; or (2) summers only — enrollment is expected only in the summer session. Once established, the pattern of enrollment may not be broken without prior approval from the Graduate College for a leave of absence or prior permission from the Office of Admissions and Records to change the enrollment pattern. Graduate students who break their patterns of enrollment without prior approval must apply for readmission in order to resume their studies.

NONDEGREE STATUS

Persons who want to do graduate-level study but who do not plan to pursue a graduate degree may apply for admission as nondegree graduate students. The same minimum admission standards apply as for degree candidates. Qualified nondegree applicants are admitted to take courses on a part-time basis subject to the availability of space. Once accepted for admission by a department and the Graduate

College, a nondegree student has the same enrollment pattern options for continuous registration as a degree candidate. Either the major department or the Graduate College, however, may discontinue the nondegree status of a student at the end of any term. Students who fail to register in a fall or spring semester after admission must reapply if they want to enroll at a later time.

There are several restrictions which apply to nondegree status. Nondegree students:

1. Are not eligible to advance enroll.
2. Cannot register until after the third day of classes of the fall or spring semester. The late registration fee will be waived if the student completes registration on or before the tenth day of instruction in a semester.
3. Are required at the beginning of each term to have approval of both their home department and the department offering the course in which the nondegree student wishes to enroll.
4. Are expected to maintain a grade-point average of 3.75.
5. Are limited to taking fewer than 3 units per semester.
6. Are not eligible for financial aid administered by the Graduate College.
7. Must reapply if they wish to acquire degree status. If later approved for degree status, a maximum of 3 units of nondegree credit may be applied to a degree, and then only after successful petition to the Graduate College.

Nondegree students who wish to study only during the summer session are not assigned to a particular department, but carry an unassigned status with the Graduate College. These students are allowed to register continuously from summer to summer until their pattern of enrollment is broken.

REGISTRATION

Currently enrolled degree students should advance enroll for the following semester and complete their registration by mail. New and other students who have not advance enrolled should meet with their advisers and complete their schedules before going through on-campus registration which occurs during the week preceding the start of instruction in a semester.

There is a $15 fee for late registration. (It is possible to be assessed a late fee up to $50 depending on nonpayment of fees by deadlines.) If, however, failure to complete registration during the regular period is in some way the fault of the University or there are extenuating circumstances such as severe illness or hospitalization, a student may petition the Records Office of the Office of Admissions and Records,

University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, Illinois 61801, for a waiver of the fee.

TUBERCULOSIS CONTROL

All new, transfer, and readmitted students are encouraged to present evidence of freedom from tuberculosis at the University's McKinley Health Center. Proof of freedom from tuberculosis is necessary for some students, such as new teaching assistants and those who have jobs handling food. International students are required to have a skin test or chest X-ray at the Health Center before completing registration. Freedom from tuberculosis is established by presenting evidence in the form of a University of Illinois or public health agency certificate dated within the previous twelve months or by undergoing a tuberculin skin test at the McKinley Health Center that is read negatively at the Health Center within forty-eight to seventy-two hours after application.

TUITION AND FEES

Since tuition and fees are subject to change, it is difficult to provide exact information. Tuition and fees are assessed on the basis of a student's status (resident or nonresident of Illinois), college of enrollment, and the number of credit hours taken each term. In computing fees, 1 unit is equivalent to 4 semester hours. A complete schedule of fees and an explanation of the eligibility requirements for full or partial exemption are available from the Tuition and Fee Assessment Section, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, Illinois 61801.

Residency for Tuition Assessment

Tuition is assessed on the basis of whether a student is a resident or nonresident of the state of Illinois in accordance with the *University of Illinois Regulations Governing the Determination of Residency for Admissions and Assessment of Student Tuition.* These regulations are published in the *Code on Campus Affairs and Regulations Applying to All Students* which is offered to all students during on-campus registration and is available at the Post-Registration Service Center in the Illini Union; in 177 Administration Building; and at the Student Assistance Center, 107 Fred H. Turner Student Services Building. The residency regulations and petitions for changing a student's status are available on request from the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 178 Administration Building, 506 South Wright Street, Urbana, Illinois 61801.

Generally, in order to be considered a resident for assessment of tuition, a person must have been a bona fide resident of the state of Illinois for at least six consecutive months immediately preceding the beginning of any term for which he or she registers and must continue to maintain a bona fide residency in Illinois. If an adult student has at least one parent who is a bona fide resident of Illinois, this six-months continuous residency rule is waived so long as the student resides in Illinois during the period of registration at the University.

Staff members of the University and allied agencies, including teaching and research assistants on appointment for at least 25 percent of full-time services for not less than three-fourths of the term as well as their spouses and dependent children, are treated as residents for tuition assessment purposes as long as they hold their appointments. Professional staff and teachers in private or public elementary and secondary schools in Illinois are also eligible for in-state tuition charges. Persons serving on active duty in one of the armed forces of the United States who are stationed and present in the state of Illinois, their spouses, and dependent children may qualify upon petition for the in-state tuition rate. A student who is a U.S. citizen or who holds permanent resident, refugee, asylum, parolee, or G-4 visa status may also qualify upon petition for resident status if he or she is married to a resident of Illinois who meets all the requirements of the residency regulations.

Installment Plan for Payment of Charges

Students enrolled on campus may elect to pay tuition, service fees, insurance, health service, flight instruction, and University residence hall charges (single-student housing only) in three approximately equal installments. The first installment is payable by the due date shown on the Post-Registration Statement (within the first ten days of classes), the second is payable in October (March for spring semester), and the third in November (April for spring semester).

Students electing the installment plan are assessed a finance charge of one percent of the amount deferred or a minimum of $2.00, whichever is greater. Deferred installments and other charges billed through the student accounts receivable system are subject to a delinquent service charge of one percent per month ($1.00 minimum) on any amounts not paid when due.

Refunds

Students who have not attended any classes nor received any student services may cancel their registration agreement by 5 p.m. on the first day of class in a term if they obtain the approval of the Dean

of the Graduate College. Students will not be charged tuition and fees if their registration is cancelled.

If students withdraw from the University during the first ten days of instruction in a semester or during the first seven days in the eight-week summer session, tuition and a portion of fees will be refunded. The University will refund tuition but retain one-half of the service fee and all of the McKinley Health Service fee and the health insurance fee. Health services and insurance coverage for students continue until the end of the term. The last day for this partial refund is noted in the *Graduate College Calendar* and in the calendar printed in each semester's *Timetable.* In cases of serious illness or injury, exceptions to these refund periods may be made by the director of admissions and records. Special refunds are provided for students who withdraw for military service after this ten- or seven-day period. If it is necessary to withdraw from the University and there is a question concerning a refund, a student should first inquire in the Graduate College Student Records Office, University of Illinois at Urbana-Champaign, B-3 North Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

FINANCIAL AID

Financial aid is available in the form of fellowships, tuition and fee waivers, teaching and research assistantships, college work-study programs, and loans.

Application Procedure for Fellowships, Assistantships, and Tuition and Fee Waivers

A single Application for Graduate Appointment submitted by a continuing student to the major department ensures consideration for fellowships, tuition and fee waivers, and departmental assistantships. A new student wishing to be considered for these appointments should complete the combined Application for Admission or Readmission to the Graduate College and Application for Graduate Appointment. Forms can be obtained from the Graduate College or from the departments.

Continuing or new students should apply by February 15th or earlier. Some departments have earlier deadlines for fellowships; other departments, at their own discretion, accept applications for assistantships and tuition and fee waivers after the February 15 deadline. Most financial aid decisions, however, are made in February and March and the first list of fellowship awards is usually announced in mid-March.

Departmental committees recommend students for fellowships or tuition and fee waivers to the Graduate College for approval. Each

department selects its own teaching or research assistants. Fellowships and waivers can be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates.

Financial need is not a factor in awarding fellowships, tuition and fee waivers, or assistantships administered by the University.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible to compete for University Fellowships, which are awarded on the basis of academic and scholarly achievement. A student need not be a U.S. citizen to apply. Departments (with Graduate College approval) may combine University Fellowship stipends with teaching or research assistantship appointments. Students should consult their departments about the pattern of available support.

Graduate College Fellowships. These fellowships are part of the Graduate College's effort to increase the enrollment of minority group students in those academic areas where they have been traditionally underrepresented. Graduate College Fellowships are often awarded to students who are beginning graduate work so that they can devote their first year entirely to study. The stipend is $6,000 for twelve months with tuition and most fees waived.

Most Graduate College fellows are given support in the form of other fellowships and assistantships with which to continue their studies in subsequent years, provided their progress is satisfactory during their first year; however, continued support cannot be guaranteed in advance. Graduate College permission is required for concurrent employment of any type.

Federal Fellowships. These fellowships have been curtailed sharply in recent years but certain programs, principally in science and education, have been maintained. Applicants for most federal fellowships must be U.S. citizens or permanent resident aliens; some programs are restricted to U.S. citizens.

Industrial, Endowed, and Special Fellowships and Traineeships. A number of firms, foundations, and individuals support fellowship awards for graduate students. The stipends and supplemental allowances for these fellowships vary, and most of them are restricted to students in particular areas of study. In all cases, these awards provide tuition and most fees. Information on applying for these fellowships and traineeships may be obtained from the department of interest.

Fellowships Awarded by National Competition. The two major national competitions in which fellowships are awarded are those of the National Science Foundation (NSF) and the Andrew W. Mellon

Foundation. The National Science Foundation annually awards about 500 three-year NSF Graduate Fellowships in science and engineering — of these about fifty are reserved for minority students and are awarded in a special competition, the NSF Minority Graduate Fellowship competition. In 1985-86 the fellowships provided a stipend of $11,100 a year for three years and complete remission of tuition and fees at the university of the student's choice. In addition, the University of Illinois Graduate College at Urbana-Champaign provides each NSF fellow with a yearly grant of $1,000 to be used for educational expenses. College seniors and first-semester graduate students are eligible for these competitions which are held each fall. Information is available in the Fellowship Office, Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

Approximately 100 Mellon Fellowships in the Humanities are awarded each year to exceptionally promising college seniors and recent graduates who are United States or Canadian citizens intending to pursue academic careers in humanistic fields. Each fellow receives $7,500 a year for a possible three years at his or her chosen institution with tuition and fees paid by the program. The competitions are held each fall. To receive application forms, applicants must first be nominated by a faculty member. Information is available from the School of Humanities, University of Illinois at Urbana-Champaign, 112 English Building, 608 South Wright Street, Urbana, Illinois 61801.

A few foundations and agencies hold fellowship competitions on a small scale and are usually restricted to specific groups such as the Committee on Institutional Cooperation fellowships for minority group students or the American Association of University Women fellowships.

Applicants who want information on fellowships and research grants should contact the Office of Campus-Wide Research Services, 128 Observatory, University of Illinois at Urbana-Champaign, 901 South Mathews, Urbana, Illinois 61801.

Assistantships

General Information. The various departments of the University appoint graduate students as teaching or research assistants. Students should apply directly to the appropriate department, using the Application for Graduate Appointment. To receive and hold an assistantship, a student must be enrolled during the terms of employment. Assistants holding appointments ranging from 25- through 67-percent time are exempt from tuition and the service fee, but not from the McKinley Health Service and health insurance fees. For students holding such

appointments or fellowships covering tuition and fees through the spring semester, the tuition and service fee exemption generally extends through the summer session. As an additional benefit, spouses and dependent children of staff members having an appointment of at least 25 percent are treated as residents for purposes of tuition assessment. Students may also apply for part-time assistantships outside their major department in one of the nonteaching units of the University, such as the Dean of Students Office.

Part-time appointments as student residence hall advisers are available as well. These jobs provide room and board only. The student affairs coordinator for staff development in the Housing Division has applications for residence hall adviser appointments.

Resignations. Students who resign their appointments before working for at least three-fourths of the term (ninety-one days during the regular semesters, forty-one days during the summer session) will be assessed tuition and fees unless they withdraw from the University at the same time or before an appointment becomes void, or unless they file a clearance form for graduation within one week following the resignation date. A term is defined as running from the first day of registration through the last day of final examinations.

Tuition and Service Fee Waivers

In addition to the tuition and service fee waivers which accompany fellowships and assistantships, a number of waivers are awarded by the Graduate College each year. These waivers provide exemption from the tuition and service fee (but not from the health service or student insurance fees) for the academic year and the summer session immediately preceding or following that year. To hold a waiver, a student must register for at least 3 units each semester during the academic year and 1½ units in the summer session. While holding a waiver, the student may accept part-time or incidental employment not to exceed twenty hours per week either with the University or with outside agencies.

Veterans who meet certain residence requirements may be eligible for exemption from tuition under the state statute concerning military scholarships. Further information may be obtained from the Student Financial Aid Office, University of Illinois at Urbana-Champaign, 420 Fred H. Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820.

Loans and College Work-Study

Students may request information about National Direct Student Loans, state and federally guaranteed loans, and College Work-Study from the Student Financial Aid Office.

Students may also apply for guaranteed loans through lenders in their hometowns who participate in one of the various guaranteed loan programs.

In addition to major educational loans, the University makes special funds available. Graduate students with cash flow problems should go to the Office of the Dean of Students where they may be eligible for either short- or intermediate-term loans.

Student Employment

Part-time jobs are sometimes available for graduate students through the Student Financial Aid Office's student employment division.

GRADUATE COLLEGE REQUIREMENTS

Graduate Degrees

The following are the general requirements of the Graduate College. *A Handbook for Graduate Students,* which is distributed to all graduate students enrolled at the University of Illinois at Urbana-Champaign, gives the requirements in more detail. Graduate students should use it as the official statement of Graduate College regulations during their graduate study on the Urbana-Champaign campus. Departments may have requirements that apply in addition to those of the Graduate College. A departmental standard higher than that of the Graduate College (e.g., the minimum grade-point average for degree eligibility) replaces the Graduate College standard.

Departmental and Graduate College policies and requirements change from time to time, and may not be immediately reflected in handbooks and other publications. New degree requirements, however, cannot be imposed retroactively on continuing graduate students. If degree requirements are changed, continuing students may complete their degree programs under the requirements in effect at the time of their initial enrollment in the Graduate College. They have the option, however, of electing to be governed by the new requirements if they so desire.

A graduate student may not be awarded more than two graduate degrees from the University of Illinois at Urbana-Champaign without prior approval from the Graduate College.

Grading System

Final Grades. Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and Ab or E (failure). The grade-point average (GPA) is computed on a five-point scale with A = 5.0. Plus and minus signs do not appear on a graduate student's official

transcript and are not used in computing the GPA, but they may be recorded on department records.

Other symbols used, but not included in the computation of the GPA are:

W — Officially withdrawn from a course.

Ex — Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next term in which the student is enrolled. Failure to complete the work within this time automatically results in a grade of E by rule. If the student does not enroll the following term, the excused grade becomes an E by rule after one calendar year.

Df — Grade temporarily deferred. Used only in research and other approved courses which extend beyond one term. The time limit for the Df grade to revert to E by rule is the same as for the Ex grade except in regard to the thesis research course (499).

S or U — Satisfactory or unsatisfactory. Used as final grades only in the thesis research course (499) and in certain other approved courses.

CR or NC — Credit or no credit. Used only if students have registered for a course under the credit–no credit option with the approval of their major departments.

Ab — Absent from the final examination without an acceptable excuse. This grade counts as a failure.

Credit–No Credit Option. Subject to the restrictions of their major department and with their adviser's approval, students may register for graduate credit under the credit–no credit option. They must, however, have at least 2 units of course work in their graduate program with grades of A through C for every unit of credit–no credit work.

GPA Computation. A registered student's GPA is computed at the end of every term and reported in the Semester Grade Report which is mailed to the student about ten days after the final day of examinations. The GPA includes units of course work with grades of A through E and Ab but not those with grades of CR, NC, Ex, Df, S, and U. The GPA does **not** include courses taken for semester hour credit (for example, physical education courses); nor does it include course work transferred from other universities or colleges with the exception of the Chicago campus of the University of Illinois. If a

grade below C is received, a student should check with his or her adviser or department to see if the course must be repeated (a student may also choose to repeat a course). In either case, the repeated courses are ignored in the computation of a graduate student's GPA and the accumulated credits toward a degree.

Minimum GPA. Students are required by the Graduate College to maintain a minimum GPA of 3.75 in order to continue in an advanced degree program. Many departments, however, demand a minimum of 4.0 or higher, and when they do, their minimum becomes the minimum enforced by the Graduate College.

Students who complete 3 or more units of graded course work with an average of less than the minimum will receive a warning letter from the Graduate College. If after the completion of 3 additional units of graded course work, a student's GPA has not been raised to or above the required minimum or if the GPA falls below it at any time thereafter, the student will be placed on limited status. If the student's average does not meet the minimum requirement at the end of the first term on limited status, he or she will be prohibited from further registration.

Advisers and departments take factors other than satisfactory grades into consideration in determining qualifications for advanced degrees. An adequate GPA does not in itself ensure continuance in an advanced degree program. Records maintained by departments often record deferred and plus and minus grades as well as written evaluations by instructors. These factors along with other skills and aptitudes are taken into consideration in departmental decisions about permitting students to continue in master's and doctoral programs.

Credit

Graduate Credit. Graduate credit at the University of Illinois at Urbana-Champaign is measured in terms of units with 1 unit equal to approximately 4 semester hours. Generally, courses in the 300 series carry graduate credit and are open to both graduate and undergraduate students. Courses in the 400 series, with the exception of some courses such as foreign language, carry graduate credit. Enrollment in these courses is restricted to graduate students.

Proficiency Examinations. Credit earned by passing proficiency examinations cannot be applied to the requirements for advanced degrees, but such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in areas considered important to a student's area of study. Proficiency examinations will be recorded only if the student is registered at the time of the examination. These examinations are usually given without cost to

the student, but a fee may be charged to defray the cost of examinations prepared by agencies outside the University. Students should consult their advisers before applying for proficiency examinations.

Credit for Work Completed Elsewhere. Students who have completed graduate work elsewhere within the last five years but have not applied the credit toward any advanced degree, may request the credit earned for that work be applied to a degree at the University of Illinois at Urbana-Champaign. Students may request that such credit be accepted by submitting petition forms accompanied by official transcripts after successfully completing at least 2 units of graduate work on the Urbana-Champaign campus. Credit for a master's degree completed at the University of Illinois or at another institution cannot be used as partial fulfillment of the requirements for a second master's degree. If a student has earned a master's degree at another university and then completed additional course work before enrolling at the University of Illinois, that student may petition to transfer credit for that additional work provided, of course, that it was done at an accredited institution. Students having a master's degree are considered to have completed the first stage of their doctoral program unless their department stipulates otherwise. It should be stressed, however, that all doctoral candidates, regardless of transfer credits or a master's degree completed elsewhere, must complete 16 units in residence on the Urbana-Champaign campus or in courses meeting in other locations which have been approved by the Graduate College for graduate credit.

Research Credit and 499. The time devoted to research is recorded by registration in 499 (thesis credit) or in 400-level courses with such titles as "Independent Study" or "Special Topics." Registration in 499 indicates that the student's research is expected to result in a thesis in partial fulfillment of the requirements for a master's or doctoral degree. Therefore, all students registering in 499 should do so only with full departmental approval. Registration in 499 is required if a thesis is being completed as a degree requirement.

Extramural Courses. Graduate courses are offered by members of the University faculty at various centers throughout the state. Pamphlets listing these courses can be obtained from the Office of Continuing Education and Public Service. Extramural courses are considered as work in residence if they are approved for graduate credit by the department offering the course and the Graduate College. Credit earned in extramural courses can be applied toward an advanced degree only if the courses are approved in advance by the adviser and constitute part of a well-integrated program.

The units of credit required for the master's degree must be earned

in courses meeting on the Urbana-Champaign campus or in courses approved by the Graduate College for offering at off-campus locations. Credit for extramural courses can be applied to the second stage of a doctoral program only within the limits of campus residency expected by the departments offering the degree.

Correspondence Courses. Credit for correspondence courses cannot be applied toward an advanced degree but can be used to fulfill prerequisites or remove deficiencies. A list of correspondence courses is available from the Office of Continuing Education and Public Service.

Requirements for the Master's Degree

The Graduate College requires a minimum of 8 units of credit for the master's degree. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. Credit applied toward the degree must be earned in courses meeting on the Urbana-Champaign campus, the Chicago campus, or in courses meeting in other locations and approved by the Graduate College for graduate credit. Master's degrees are conferred in May, August, October, and January. Master's candidates must complete all degree requirements, under normal circumstances, within five years after their first registration in the Graduate College.

Some departments require a final examination for the master's degree. Individual departments also determine master's degree thesis requirements. Some departments require or recommend a thesis, but others ask for a "substantial research paper," or only require the minimum 8 units of course work. Thesis credit is earned in courses numbered 499 in each department. No more than 3 units of 499 can be applied to the master's degree and in some departments only 2 units.

Requirements for the Doctoral Degree

Credit and Residence. Doctoral programs are divided into three stages, as described below, and must include a minimum of 24 units of credit. At least 16 units, including thesis credit, must be earned in courses meeting on the Urbana-Champaign campus, at the Chicago campus, or in other locations which have been approved by the Graduate College for graduate credit. After the residence requirement has been fulfilled, a student who plans to leave campus may petition the Graduate College for permission to register in absentia for thesis credit.

Stage I — The master's degree or its equivalent (8 units, or 32 semester hours, of acceptable graduate work at this or another accredited university).

Stage II — One or more additional years devoted to course work and research in preparation for the preliminary examination, and fulfillment of the department's special requirements, if these have not been satisfied earlier. Each department has a procedure for evaluating a student's progress toward the doctorate. This evaluation, whether by examination or other formal review, results in a decision as to whether or not a student is making satisfactory progress. This decision will be communicated in writing to the student and to the Graduate College. Such evaluation will take place no later than the end of the second year after a student enters the Graduate College. In some departments, this evaluation may take the form of a qualifying examination which a student must pass before entering Stage II of a doctoral program. Passing the preliminary examination marks the end of Stage II.

Stage III — Research and other activities culminating in an approved dissertation and final oral examination. Continuous registration, excluding summer sessions, should be maintained until a student has completed the credit requirement for the doctoral degree. If a student at this stage cannot maintain continuous registration, he or she must apply for readmission in order to continue doctoral study. Registration in 499 (thesis credit) is also required for the term in which a student takes the final examination, regardless of when the thesis will be deposited with the Graduate College or when the degree will be conferred.

Time Limit. Doctoral candidates must complete all degree requirements within seven years after their initial registration in the Graduate College. Those entering directly into Stage II, with a master's degree from another university or with a significant lapse of time since earning a master's degree on this campus, have six years in which to complete degree requirements.

Foreign Language Requirement. Each department establishes its own foreign language requirement; some allow for substitution of research skills in computer programming language or statistical analysis.

Preliminary and Final Examinations

Preliminary examinations taken at the end of Stage II of doctoral programs may be oral, written, or both, depending on the department's policy. Final examinations are oral and public.

The dean of the Graduate College appoints doctoral committees,

at departmental request, to administer preliminary and final examinations. These committees must be composed of three or more members of the graduate faculty.

Decisions of the committees for both preliminary and final examinations must be unanimous. Departments outline their policies regarding preliminary and final examinations as part of the descriptions of their advanced degree programs and requirements which are distributed to graduate students in the department.

Theses

All candidates for the Ph.D. and candidates for most other doctoral degrees are required to write a thesis. Individual departments may have special requirements in this respect. In addition, all completed theses must be acceptable for deposit in the Graduate College; a thesis that fails to meet Graduate College standards will be rejected. The thesis must be the work of a single author.

Before the degree is conferred, a student may find it desirable or expedient to publish some of the findings which will later be incorporated in the thesis. If this is done, an appropriate acknowledgment of the earlier publication should be included in the thesis. The Graduate College encourages such publication, but the thesis may not be published in its entirety before all degree requirements have been met.

If thesis research involves the use of human subjects, warm-blooded animals, the use of hazardous materials or procedures, or the utilization of PLATO services, the student must comply with the University's policies and procedures governing such work.

Because all theses are made available to the public, a thesis containing classified material, i.e., material deemed nonpublishable under Federal Security Regulations, cannot be accepted.

Advanced Certificate

Some departments, such as those in the College of Education offer advanced certificates for those students who are interested in additional professional training beyond the master's degree but who are not planning to obtain the doctorate. These programs usually require the completion of 8 units of course work beyond the master's degree. Information concerning specific advanced certificate programs is available from departmental offices.

PROGRAMS OF STUDY

The graduate programs offered by the Graduate College, through the various divisions, schools, institutes, centers, and departments of the University of Illinois at Urbana-Champaign, are described on the following pages, as well as the areas of specialization within these programs. Included also are the offerings of several interdisciplinary areas of concentration, such as population studies, environmental studies, American civilization, and African, Asian, Russian, and Latin American area studies.

The minimum requirements for admission and other requirements for graduate degrees are given for each program. The prospective student is reminded that he or she is seeking admission to the Graduate College of the University of Illinois at Urbana-Champaign and cannot be admitted to the college or to a particular academic department offering programs leading to advanced degrees without satisfying the admission requirements of both. Likewise, both departmental and Graduate College requirements must be met before an advanced degree is awarded by the University of Illinois at Urbana-Champaign. If departmental requirements are higher than the minimum Graduate College requirements, e.g., for continuation in a graduate degree program and the awarding of the degree, the higher standard applies.

The University of Illinois at Urbana-Champaign *Courses Catalog,* published biennially, lists all the undergraduate and graduate courses offered at the Urbana-Champaign campus. A listing of courses offered each term is published in the *Timetable,* issued in April for the fall semester, in March for the summer session, and in October for the spring semester. Copies of the *Courses Catalog* and *Graduate Programs* catalog are for sale through the Illini Union Bookstore, 715 South Wright Street, Champaign, Illinois 61820. Copies can also be purchased by mail from the bookstore. The *Timetable* is available free of charge at the information desk of the Illini Union. The graduate application for admission packet is available free of charge from the Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

ACCOUNTANCY

Head and Director of Graduate Studies: F. L. NEUMANN

Correspondence and Information: Head of the Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: N. M. BEDFORD, G. D. BRIGHTON, H. P. HOLZER, O. E. JOHNSON, Y. KWON, J. C. MCKEOWN, F. L. NEUMANN, H. M. SCHOENFELD, C. H. SMITH, E. WILLIS, V. K. ZIMMERMAN

Associate Professors: P. J. BECK, M. H. BERRY, R. BOLAND, C. E. BROWN, J. S. CHANDLER, T. J. FRECKA, R. W. JAMISON, I. SOLOMON, R. E. ZIEGLER

Assistant Professors: R. GREENBERG, K. HREHA, D. NITTERHOUSE, S. REITER, F. SHARP, R. F. SHARP, P. A. SILHAN, D. ZIEBART

Graduate Degree Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science (M.A.S.) and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the M.A.S. degree requirements can be completed in one year. For nonbusiness graduates, the M.A.S. degree can be earned in two years. The Ph.D. degree takes approximately three to four years of full-time study and research.

Admission. All applicants, native or foreign, are required to take the Graduate Management Admission Test. This test should be taken early enough to ensure that the results will be available to the department prior to action on admission. The admission requirements of the Graduate College also apply. In addition, all foreign applicants must take the Test of English as a Foreign Language.

Master of Accounting Science. The Master of Accounting Science degree provides a two-year program for those with little or no background in accounting or as little as one year's study for those who wish to expand on their undergraduate degree in accountancy or other business fields. All candidates are required to complete at least 8 units of course work. At least 5 units must be at the 400 level; 4 units must be in accounting; and of these 4 units, 3 are specified and 1 is elective. The remaining 4 units are general electives available for meeting the individual student's plans. For example, the student may use some or all of them to develop an area of specialization, such as auditing, taxation, information systems, financial accounting, managerial accounting, not-for-profit accounting, and international accounting. A student's program is individually developed in consultation with a faculty adviser. No thesis is required, although the student may elect to write one.

To be eligible to complete the M.A.S. program in 8 units, a student should have completed an equivalent of the undergraduate curriculum in accountancy at the University of Illinois at Urbana-Champaign including the following: at least 21 hours of undergraduate work in accounting; a course in general economic theory, in intermediate microeconomics, in computer programming and applications, and in each of the functional fields of business; two courses in statistics; and courses including finite mathematics, linear algebra, and calculus.

A student with little or no business and accounting background is required to complete up to an additional 8 units of work. In the first year of this two-year program, a student takes four specified graduate courses in accountancy. Depending upon his or her background, the student also enrolls in courses in statistics, economics, mathematics, computer programming, and the functional areas of business. A student who already meets any of the requirements of the two-year program receives some credit toward the total 16-unit requirement. In the second year, the requirements are those for all M.A.S. students, as described above.

Doctor of Philosophy. Applications for admission to the doctoral program, supported by three letters of recommendation, must be approved by the department admissions committee, which may require an oral or written examination. For students with a

bachelor's degree and adequate background in appropriate areas, the requirements for the Doctor of Philosophy degree include the following: credit in micro- and macro-economics; two courses in behavioral science or financial economics; two courses in statistics; five minor area and research technique courses (four of which must be nonaccounting courses); four accounting courses; and the thesis. The student's doctoral program is determined in consultation with a faculty advisory committee. The student's tentative plans for the doctoral thesis serve as a guide in planning the program.

In addition, the candidate must pass written and oral preliminary examinations and an oral final examination on the doctoral thesis. In the preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory in both its external and internal dimensions and of research methods; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in the required areas of economic theory, quantitative methods, and behavioral science or financial economics. Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the accountancy graduate program.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to help accounting faculty and students from other countries come to the University of Illinois at Urbana-Champaign for study and research in accountancy.

ADVERTISING

Head of the Department: K. B. ROTZOLL
Correspondence and Information: Head of the Department of Advertising, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professor: K. B. ROTZOLL
Associate Professors: J. E. HAEFNER, K. M. LANCASTER
Assistant Professors: C. J. COBB, S. E. MIDDLESTADT, T. C. O'GUINN

Graduate Degree Program. The Department of Advertising offers graduate work leading to the Master of Science degree. For the program leading to the Doctor of Philosophy in Communications, see page 96.

Admission. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an accredited institution of recognized standing. All applicants are required to submit results from either the Graduate Record Examination or the Graduate Management Admission Test and are required to attach to their applications a short essay indicating why they want to take graduate work in advertising. The Graduate College admission requirements also apply.

Master of Science. Candidates for the M.S. degree must complete at least 9 units, of which at least 4 are 400-level courses. These will include at least 5 units of course work in advertising, including Advertising 481, 482, and either 483 or 484. A minimum of 2 units must be taken outside the Department of Advertising. Students with an undergraduate major in advertising can usually earn the M.S. degree in one academic year and one summer session if they take a full course of study. Applicants without an undergraduate major in advertising may be required to take up to nine additional background courses in addition to the 9 units.

At the time of admission, students will be advised of the probable number of units required for graduation. At the time of registration advising, students will be informed of the exact number of units needed to fulfill the M.S. requirements.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Acting Head of the Department: S. M. YEN

Correspondence and Information: Head, Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, 104 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. E. BOND, J. D. BUCKMASTER, H. H. HILTON, C. O. HOPKINS, A. I. ORMSBEE, J. E. PRUSSING, L. H. SENTMAN, S. M. YEN, A. R. ZAK

Associate Professors: H. O. BARTHEL, L. A. BERGMAN, T. A. W. DWYER, K. D. LEE, K. R. SIVIER

Assistant Professors: R. A. BEDDINI, B. A. CONWAY, N. S. NAMACHCHIVAYA

Graduate Degree Programs. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Students interested in mass transportation and deep-sea submergence vehicles, for example, find graduate study in this department applicable. Typical areas of concentration are aerodynamics, aeroelasticity, space mechanics, flight mechanics, propulsion, structural mechanics, optimization and control, manual control and display systems, human factors in aerospace systems, and air and noise pollution.

Admission. The prerequisite for graduate study normally is the equivalent of the undergraduate courses required at the University of Illinois at Urbana-Champaign for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Admission requirements of the Graduate College apply.

Master of Science. Candidates for the degree of Master of Science are required to complete a minimum of 8 units of credit, 7 units of course work and 1 unit of thesis credit. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in aeronautical and astronautical engineering. It is possible for a student with a one-half–time appointment to complete the requirements for the M.S. degree in two semesters and a summer session or in three semesters.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of Doctor of Philosophy. Each student plans a program in consultation with a departmental adviser. Courses offered by departments other than the Department of Aeronautical and Astronautical Engineering may be included in the major area of study when these courses are of particular value to the work that students desire to emphasize. The major and minor programs must meet with the approval of the head of the department. Minimum requirements for the degree consist of 8 units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from 8 units of thesis research. A reading knowledge of one foreign language is optional. Students who do not elect the foreign language option must complete a minimum of 10 units of course work for the Ph.D. degree beyond the M.S. degree requirements. Of the total Ph.D. course work requirements, at least 6 units must be at the 400 level and 4 of these 6 units must be in aeronautical and astronautical engineering.

AFRICAN STUDIES

Director of Graduate Studies: D. CRUMMEY
Correspondence and Information: Director of the Center for African Studies, University of Illinois at Urbana-Champaign, 1208 West California Street, Room 101, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. ALEXANDER, D. CRUMMEY, J. F. DUE, J. M. DUE, R. HAY, B. KACHRU, R. KANET, E. KELLOGG, M. KENSTOWICZ, C. KISSEBERTH, R. SCHOEN, D. SHIMKIN, A. SOFRANKO, C. STEWART, B. YATES, G. YU
Associate Professors: E. ACCAD, E. BOKAMBA, A. GLAZE, C. KELLER, Y. SCHEVEN
Assistant Professors: S. AMBROSE, T. BASSETT, A. DECK A. GOTTLIEB, M. SAUL

Graduate Degree Programs. Graduate minors in African studies are administered by the director of the Center for African Studies. African studies graduate programs complement and supplement major work which students carry out within their primary disciplines. Application for admission to graduate study should be made through the appropriate department.

Minor for the Master's Degree. A candidate for the master's degree who elects African studies as a minor must secure approval from the center and must complete at least 2 units of graduate credit from the courses approved by the center. Among the fields in which courses are available are: agricultural economics, anthropology, art history, comparative literature, economics, education, French, geography, history, linguistics, political science, and sociology.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects African studies as a minor must secure approval from the center and must earn at least 4 units of graduate credit in approved courses in at least two departments. Courses are available in the fields listed above.

Financial Aid. Each year the center is generally able to assist a limited number of graduate students in area studies financially through awards of Foreign Language and Area Studies Fellowships.

AGRICULTURAL ECONOMICS

Head of the Department: WESLEY D. SEITZ
Correspondence and Information: Head of the Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 305 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. B. BAKER, P. J. BARRY, R. J. BURDGE, F. DOVRING, J. M. DUE, D. E. ERICKSON, L. P. FETTIG, F. C. FLIEGEL, T. L. FREY, H. D. GUITHER, L. D. HILL, R. A. HINTON, G. G. JUDGE, E. D. KELLOGG, R. M. LEUTHOLD, D. A. LINS, A. G. MUELLER, J. W. ROBINSON, S. C. SCHMIDT, J. T. SCOTT, W. D. SEITZ, A. J. SOFRANKO, S. T. SONKA, R. G. F. SPITZE, E. R. SWANSON, C. R. TAYLOR, J. C. VAN ES
Associate Professors: J. B. BRADEN, D. L. CHICOINE, P. GARCIA, D. L. GOOD, M. R. GROSSMAN, S. R. JOHNSON, M. N. LEATH
Assistant Professors: A. BOUZAHER, J. S. EALES, R. L. FARNSWORTH, R. J. HAUSER, R. H. HORNBAKER, M. A. HUDSON, G. V. JOHNSON, C. H. NELSON, S. E. OFFUTT, S. R. THOMPSON, L. J. UNNEVEHR, L. R. ZAVALETA

Graduate Degree Programs. The Department of Agricultural Economics offers courses leading to the Master of Science and Doctor of Philosophy degrees. Areas of concentration and specialization are offered in agricultural finance, agricultural and food policy, farm management and production economics, international agricul-

tural economics, marketing and agricultural prices, natural resource economics, quantitative and research methods, and rural community development. Rural community development has an emphasis on either agricultural economics or rural sociology.

Master of Science.
Admission. Graduate College admission requirements apply. Applicants are favorably considered for admission if they are adequately prepared for advanced study as demonstrated by their previous program of study and their scholastic record. Students having less than 12 semester hours of agricultural economics or economics may be required to take additional courses to adequately prepare themselves for graduate studies. Students who desire to specialize in rural community development with the rural sociology emphasis should have had a minimum of 6 semester hours of rural sociology or sociology.

The minimal 8-unit program must include 2 units of economics, at least 1 of which must be economic theory; 4 units of agricultural economics, including thesis credit; 1 unit in quantitative methods and research methodology that could also fulfill part of the economics or agricultural economics requirement; and 2 units of open electives. At least 4 units must be in 400-level courses, 2 of which must be agricultural economics. No more than 2 units of thesis credit can be included in the 8-unit program. The required thesis may be waived under certain circumstances. Students are examined orally on the thesis and/or a general knowledge of their field to determine their qualifications for the master's degree.

Doctor of Philosophy.
Admission. Graduate College admission requirements apply. Applicants with a master's degree in agricultural economics or a closely related discipline with an outstanding scholastic record are favorably considered for admission.

The doctoral candidate must complete 8 units of nonthesis courses beyond the master's degree. The total graduate program must include a minimum of 3 units in economics other than quantitative and research methods courses, including 1 unit each of advanced 400-level micro- and macro-theory. The program must also include 1 unit each of approved courses in econometrics and in mathematical programming. The student must pass three written and one oral preliminary examinations, submit an acceptable thesis, and pass a final oral examination. A minimum of 16 units beyond the master's degree, including thesis credits, is required.

Financial Aid. University Fellowships and tuition and fee waivers are awarded by the Graduate College. Several fellowships are also awarded on the basis of competition among graduate students studying in departments in the College of Agriculture. In addition, the Department of Agricultural Economics awards several fellowships and maintains a number of part-time positions for graduate students, most of them in research. These assistantships are offered on a competitive basis among graduate students in the departmental program. For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Chairperson of the Division: EARL B. RUSSELL
Correspondence and Information: Division of Agricultural Education, University of Illinois at Urbana-Champaign, 357 Education Building, 1310 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professor: B. E. SWANSON
Associate Professor: E. B. RUSSELL
Assistant Professor: E. W. OSBORNE

Graduate Degree Program. The Master of Science program has been planned as a fifth year of work for students who have completed the requirements of the four-

year agriculture curriculum for secondary teachers of agricultural occupations or its equivalent.

Admission. The program is open only to students who have received a bachelor's degree and also have a teaching certificate. The Graduate College admission requirements apply.

Master of Science. Candidates must earn 8 units: 4 units in agriculture, 2 units in education, and 2 units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields. At least 3 of the 8 units must be in 400-level courses.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than 3 units from any one department. A master's thesis is optional.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for the Department of Vocational and Technical Education in the College of Education.

AGRICULTURAL ENGINEERING

Head of the Department: Roscoe L. Pershing

Correspondence and Information: Head of the Department, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 338 Agricultural Engineering Sciences Building, 1304 West Pennsylvania Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. E. Bode, D. L. Day, C. E. Goering, D. R. Hunt, B. A. Jones, Jr., W. D. Lembke, J. K. Mitchell, R. L. Pershing, E. D. Rodda, G. C. Shove, J. C. Siemens

Associate Professors: R. C. Coddington, J. W. Hummel, M. R. Paulsen

Assistant Professors: N. L. Buck, L. K. Ewing

Graduate Degree Programs. The Department of Agricultural Engineering offers the Master of Science and Doctor of Philosophy degrees.

Master of Science. Admission requirements include completion of an undergraduate program equivalent to the agricultural engineering curriculum at the University of Illinois at Urbana-Champaign with at least a 4.0 grade-point average (A = 5.0) for the terms containing the last 60 semester hours of course work. Applicants whose native language is not English must present a TOEFL score of 570 or more (also see Graduate College minimum). Students may concentrate study in one of the areas of research specialization listed below. Supporting course work includes mathematics; computer science; statistics; engineering mechanics; civil, electrical, and mechanical engineering; agronomy; food science; and other appropriate fields. The completion of 8 units and the preparation and defense of a thesis involving an analytical or experimental investigation (which satisfies 2 units of credit) are required of all M.S. candidates except those granted a waiver of thesis. At least 3 of the units for the M.S. degree must be in 400-level courses, and 2 of these units must be in agricultural engineering. Candidates permitted to pursue a nonthesis degree must complete a minimum of 9 units.

Doctor of Philosophy. Admission is limited to individuals who have demonstrated exceptional ability through outstanding performance in obtaining the Master of Science degree and/or through a high degree of technical and professional accomplishment. Candidates must also satisfy entrance requirements for the M.S. degree program.

Opportunities for study are found in all of the areas of specialization listed below. Candidates will be required to include course work and staff consultation from the various disciplines within the University to build strong technical programs and to fulfill the standard requirements of the Graduate College. There are no foreign language requirements; however, a high degree of competence may be required in areas associated with thesis research, such as statistics, simulation, and computer programming.

Research Interests. Students may specialize in power and machinery (tillage and soil dynamics, crop production systems, pesticide application, finite element analysis, dynamic system simulation, operations analysis, engines and alternative fuels); soil and water mechanics (agricultural hydrology, drainage, irrigation, mechanics of erosion, and water quality); structures and environment (structural analysis and design, environmental control, livestock housing systems, and waste management and utilization); electric power and processing (crop conditioning, processing and milling; grain quality evaluation; livestock automation systems; physical properties of agricultural products; and food engineering); or general areas (alternative energy systems, and microprocessor control applications).

Financial Aid. Fellowships, supported both by University and by College of Agriculture funds, are available on a competitive basis. A limited number of assistantships, normally on a half-time basis, providing both teaching and research experience are available.

AGRONOMY

Head of the Department: L. E. SCHRADER

Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-201 Turner Hall, 1102 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. E. ALEXANDER, W. L. BANWART, R. L. BERNARD, C. M. BROWN, A. W. BURGER, S. G. CARMER, J. M. J. DEWET, J. W. DUDLEY, D. W. GRAFFIS, H. H. HADLEY, R. H. HAGEMAN, J. E. HARPER, J. J. HASSETT, J. D. HESKETH, T. D. HINESLY, R. G. HOEFT, T. HYMOWITZ, J. A. JACKOBS, I. J. JANSEN, R. L. JONES, E. L. KNAKE, R. J. LAMBERT, J. R. LAUGHNAN, M. D. MCGLAMERY, D. A. MILLER, C. D. NICKELL, W. L. OGREN, T. R. PECK, D. B. PETERS, R. W. RINNE, L. E. SCHRADER, R. D. SEIF, F. W. SLIFE, G. F. SPRAGUE, F. J. STEVENSON, E. W. STOLLER, W. M. WALKER, L. M. WAX, E. J. WEBER, L. F. WELCH, J. M. WIDHOLM, C. M WILSON

Associate Professors: C. W. BOAST, M. A. COLE, R. A. GRIFFIN, A. G. HEPBURN, M. G. HUCK, E. B. PATTERSON, G. E. PEPPER, A. R. PORTIS, J. W. STUCKI, J. T. WOOLLEY

Assistant Professors: P. BAVEYE, F. E. BELOW, T. J. BICKI, D. P. BRISKIN, R. G. DARMODY, R. A. LIEBL, R. L. MULVANEY, E. D. NAFZIGER, R. L. NELSON, K. R. OLSON, E. M. OROZCO, R. M. VANDEN HEUVEL, B. L. VASILAS

Graduate Degree Programs. The Department of Agronomy offers course work leading to the Master of Science and Doctor of Philosophy degrees. Great flexibility exists for planning programs in various areas, and no rigid curricula are prescribed. The following areas of specialization indicate the breadth of opportunities, although they are not mutually exclusive: biometry and data processing, crop ecology, crop evolution, crop production, environmental agronomy, environmental physics, genetic engineering, international agronomy, pedology, plant breeding and genetics, plant cytogenetics, plant molecular genetics, plant physiology and biochemistry, soil microbiology and biochemistry, soil chemistry and mineralogy, soil fertility, soil management, soil physical and colloidal chemistry, soil physics, water relations and management, and weed science.

Admission. Applicants whose highest degree is the bachelor's degree will be considered for admission to the M.S. program. Admission to the Ph.D. program will be considered for applicants with the M.S. or those who are nearing completion of that degree. Because of the diversity of programs in the Department of Agronomy, there is considerable variation in the preparation that is needed. Undergraduate training equivalent to that required at the University of Illinois at Urbana-Champaign for majors in agricultural science (plant or soil science), agronomy, crops, or soils is appropriate. For some programs, greater emphasis is given to previous training in plant sciences, chemistry, geology, or mathematics. In all cases, previous experience or other significant evidence of serious interest in crops and/or soils is expected. A grade-point average of at least 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. A candidate must complete 8 units of graduate study as approved by his or her graduate advisory committee with a grade-point average of at least 4.0, must present an acceptable thesis, and pass an oral examination. At least 3 units must be at the 400 level, including at least 2 units in agronomy and at least 1 unit of course work other than Agronomy 499. An acceptable thesis is required, although the thesis may be waived by petition in unusual situations and additional course work substituted. The master's examination is oral, although written examinations may be required at the option of the examining committee.

Doctor of Philosophy. A candidate must complete a minimum of 24 units of graduate study (16 units of in-residence credit beyond the M.S., 8 units of which must be course work) as approved by his or her graduate advisory committee with a grade-point average of at least 4.0 and must pass an oral examination, which consists of a defense of the thesis and examination on such other matters as members of the examining committee may select. Written examinations may be required at the option of members of the examining committees. At least 4 units of 300- or 400-level courses outside the Department of Agronomy are required. Residence requirements are the same as those of the Graduate College.

If the graduate advisory committee requires a student to demonstrate reading competence in French, German, or other approved foreign languages, the course work requirement may be reduced by 1½ units for each foreign language (maximum of 3 units substituted). Students whose native language is not English may fulfill the requirement for one language with their native tongue, if approved by the advisory committee.

Research Interests. Excellent laboratory, greenhouse, and field research facilities are available. A network of experimental locations throughout the state and cooperative arrangements with other states make studies possible under a wide range of environmental and climatic conditions. The department's involvement in international programs may provide opportunities to conduct thesis research abroad. Brochures are available upon request that provide more detail about the graduate program and faculty research interests.

AMERICAN CIVILIZATION

Graduate Degree Program. An interdisciplinary concentration in American civilization is available leading to the Master of Arts or Doctor of Philosophy degree. Students interested in this program enroll in the Department of History. Further information may be obtained from the School of Humanities or the Department of History.

ANIMAL SCIENCES

Head of the Department: W. R. Gomes

Correspondence and Information: Department of Animal Sciences, University of Illinois at Urbana-Champaign, 328 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. M. Bahr, D. H. Baker, O. G. Bentley, M. P. Bryant, J. R. Campbell, J. H. Clark, R. G. Cragle, S. E. Curtis, P. J. Dziuk, G. C. Fahey, Jr., U. S. Garrigus, R. W. Gomes, R. W. Gorden, M. Grossman, P. C. Harrison, M. F. Hutjens, A. H. Jensen, K. W. Kelley, B. L. Larson, J. R. Lodge, S. P. Mistry, J. L. Robinson, S. L. Spahr

Associate Professors: P. J. Bechtel, L. L. Berger, D. H. Buck, T. R. Carr, R. A. Easter, D. Gianola, H. W. Gonyou, C. N. Graves, E. H. Jaster, D. J. Kesler, M. R. Murphy, C. M. Parsons, R. D. Shanks, D. L. Thomas, L. H. Thompson

Assistant Professors: G. L. Czarnecki, R. L. Fernando, P. D. George, W. L. Hurley, L. M. Lawrence, H. A. Lewin, F. K. McKeith, D. G. McLaren, N. R. Merchen, J. L. Montgomery, J. E. Novakofski, D. F. Parrett, D. P. Philipp, B. A. White, M. J. Wiley

Graduate Degree Programs. The Department of Animal Sciences offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Fields of specialization include animal breeding and genetics, animal behavior, biochemistry, environmental physiology, immunobiology, meat science and muscle biology, microbiology, nutrition, systems of animal management and production, and physiology of lactation or reproduction. Beef and dairy cattle, horses, poultry, sheep, swine, and a variety of companion and laboratory animals are available for study.

Admission. The Graduate College admission requirements apply. A strong background in the biological, physical, and mathematical sciences is essential preparation for graduate work in specialized areas of animal sciences. The department desires that applicants have a strong undergraduate background in animal sciences.

Master of Science. The Master of Science in Animal Sciences may be completed with or without a thesis. Candidates are required to complete a minimum of 8 units of graduate work. At least 3 units must be in 400-level courses, 2 of which must be in animal sciences. No more than 2 units of thesis credit may be included in the program. Candidates are required to register in the Seminar during each semester of study.

Doctor of Philosophy. The doctoral candidate must complete at least 8 units of nonthesis courses beyond the M.S. degree. The program of study must include registration in the Seminar during each semester of study. The student must pass preliminary examinations administered by a committee of faculty members and must also complete 8 units of thesis research and submit an acceptable thesis. The final examination is limited to a presentation and defense of the thesis research.

ANTHROPOLOGY

Head of the Department: Norman E. Whitten, Jr.

Director of Graduate Studies: F. K. Lehman

Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, 607 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E. M. Bruner, C. E. Cunningham, E. Giles, H. A. Gould, D. C. Grove, D. W. Lathrap, F. K. Lehman, B. Nettl, D. W. Plath, N. E. Whitten, Jr., R. T. Zuidema

Associate Professors: C. J. Bareis, J. W. D. Dougherty, C. M. Keller, L. L. Klepinger, E. Mayer, T. J. Riley

Assistant Professors: S. J. Ambrose, A. S. Anagnost, P. A. Garber, A. Gottlieb, R. B. Lewis, G. G. Pope, M. Saul, O. Soffer-Bobyshev, J. M. Watanabe

Professors Emeriti: J. C. McGregor, D. B. Shimkin

Graduate Degree Programs. The Department of Anthropology offers graduate work leading to the Master of Arts and the Doctor of Philosophy degrees.

Admission. A student without the equivalent of this department's undergraduate concentration may be admitted to either degree program but will be required to make up deficiencies in his or her background in anthropology. The Graduate College admission requirements apply.

Master of Arts. The master's degree can be a first stage toward the doctorate or may be used by students wishing to apply a knowledge of anthropology to some related field. A candidate for the master's degree must complete at least 8 units of graduate credit and present a thesis or paper in lieu of a thesis acceptable to two members of the graduate faculty within the Department of Anthropology. At least 3 units must be at the 400 level, and 2 of these units must be in anthropology.

Doctor of Philosophy. Requirements for the Ph.D. include 16 units of graduate course work beyond the M.A., a preliminary examination administered by the student's advisory committee, and a final examination. The preliminary examination consists of a predissertation research paper, a proposal for doctoral research, and a written examination designed by the student's doctoral committee followed by a 2-hour oral examination conducted by the same committee. The final examination is a defense of the doctoral thesis, which is also conducted by the student's doctoral committee. High proficiency in one or reading ability in two foreign languages is required; however, statistics, computer science, or similar expertise may be used to satisfy the requirements in place of one foreign language. Fieldwork is strongly recommended though not required.

Research Interests and Facilities. Courses and individualized study provide broad coverage of sociocultural, linguistic, archaeological, and physical anthropology. The department provides special emphases in the analyses of state ideologies and cultural transformations; complex societies in transition; kinship and gender relationships; symbolism, cosmology, art, and religion; politics, economics, and ethnicity; language and culture; text and narrative; formal analysis and mathematical modeling; medical anthropology; agricultural origins, evolution, and development; hunter-gatherer adaptations; diet and nutrition; paleoecology and paleobiology; comparative and analytical osteology; primate behavior and ecology. The department's Laboratory of Anthropology has constituent archaeological, paleoethnobotany, faunal analysis, human biology, stable-isotope, and ethnographic laboratories. The department is the headquarters of the Illinois Archaeological Survey and offers summer field school training in archaeology. Departmental funds are available for graduate students' summer field research. An archaeology field school is held at various locations in Illinois and/or Kentucky (location varies from year to year). Graduate student programs are enriched by close departmental relationships with the interdisciplinary area studies centers on campus: Africa, East Asia and the Pacific, South Asia, Latin America and the Caribbean, Russian and East European, and with the Center for Afro-American Studies, the Women's Studies Program, Women in Development Program, World Heritage Museum, Natural History Museum, Krannert Art Museum, Research Board, and International Programs and Studies. The department recently ranked first in the United States in employment of graduates at the time of receiving doctorates. Formal agreements between the University and various governments and institutes facilitate research in many nations. Training in languages, including Quechua, Japanese, Chinese, Russian, Indonesian, Thai, Burmese, Swahili, Hausa, Lingala, Wolof, Arabic and Shona, is available. Students have ready access to the extensive computer facilities of the University and to the department's facilities which include microcomputers and mainframe computer terminals, a graphic digitizer, photographic equipment, video equipment, and other research-oriented equipment. The *Journal of the Steward Anthropological Society,* edited by graduate students, has been published since 1969.

ARCHITECTURE

(Including Architectural Engineering)

Director of the School: R. ALAN FORRESTER

GRADUATE FACULTY

Professors: J. R. ANDERSON, J. S. BAKER, A. C. BIANCHINI, W. L. CREESE, W. ENG, R. A. FORRESTER, B. L. HUTCHINGS, R. D. KATZ, S. T. LANFORD, W. H. LEWIS, H. J. MILLER, A. NOTARAS, W. J. O'CONNELL, S. PRASAD, I. SCHOUSBOE, J. H. SWING, R. L. TAVIS, D. J. WICKERSHEIMER, C. A WINKELHAKE

Associate Professors: J. G. ALBRECHT, M. M. ALI, D. E. BERGESON, R. J. BETTS, V. V. CAFOUREK, W. H. ERWIN, J. S. GARNER, L. A. LEFFERS, C. A. MOYER, R. E. SCHMITT, J. E. SIMON, R. L. SMITH, J. P. WARFIELD, H. C. WHITE

Assistant Professors: K. H. ANTHONY, R. G. OUSTERHAUT

Graduate Degree Programs. The School of Architecture offers three graduate programs, each leading to the Master of Architecture degree: a two-year program for those holding a four-year Bachelor of Science in Architectural Studies (or similar degree in architecture); a one-year program for those holding a five-year Bachelor of Architecture professional degree; and a three-and-one-half–year program for those holding a bachelor's degree in any field other than architecture. The two-year program and the three-and-one-half–year program are professional degree programs accredited by the National Architectural Accreditation Board.

The School of Architecture, together with the Departments of Business Administration, Urban and Regional Planning, and Civil Engineering offer graduate programs leading to the following double degrees: Master of Architecture and Master of Business Administration, Master of Architecture and Master of Urban Planning, and Master of Architecture and Master of Civil Engineering (Construction Management).

Admission. Admission with full standing requires a preprofessional architectural degree equivalent to the four-year Bachelor of Science in Architectural Studies from the University of Illinois at Urbana-Champaign or a five-year Bachelor of Architecture professional degree. The admission average must be at least 4.0 (A = 5.0). For those applicants who meet the degree requirements but have an admission average under 4.0, admission with limited standing may be permitted if evidence of exceptional qualifications is presented. Admission with limited standing may also be permitted for those applicants holding a degree less than equivalent to the University of Illinois at Urbana-Champaign degree provided that equivalency can be established through additional course work.

Applicants are ranked and selected on the basis of the following criteria: undergraduate academic performance on the basis of admission averages determined from official college transcripts, portfolio or brochure of applicant's past work in the architectural field, a statement of objectives, three letters of recommendation, and relevant professional work experience.

Master of Architecture (Two-Year Graduate Program). The two-year professional degree program, intended for those entering with a four-year baccalaureate in architectural studies, emphasizes further study in architectural disciplines, study in depth in one optional area of concentration, and/or participation in research.

Advanced study in architectural disciplines, building upon the fundamentals established in a four-year undergraduate study program, comprises the initial phase of the two-year graduate program. This initial phase is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of course work required of all candidates for the Master of Architecture professional degree.

Election of an optional area of concentration comprises the final phase of the graduate program and allows a student to devote two semesters' work to a specific field of his or her choice. The department offers optional areas of concentration in architectural design, architectural history, historic preservation and rehabilitation,

housing environments, architectural management, architectural practice, architectural structures, and urban design. Some of these options afford the opportunity for further specialization; for instance, social and behavioral factors in design, campus planning, criticism, industrialization, design methods and theory, interior architecture, and construction management. There is a strong shared interest in environment and behavior studies with the Departments of Landscape Architecture and Urban and Regional Planning and with the Office of Housing Research and Development. Individualized areas of concentration may also be pursued through an individual study option for which a research thesis is usually required.

Participation in or initiation of research is encouraged in the optional areas of concentration. For those qualified, many opportunities currently exist in departmental and interdepartmental areas. These include unique research opportunities within the School of Architecture based on research grants from various external funding agencies; the Community Research Center, a unit of the School of Architecture; the Office of Housing Research and Development, a unit of the Graduate College; and the Small Homes Council–Building Research Council, a unit of the College of Fine and Applied Arts.

A candidate admitted with full or qualified standing to the two-year professional degree program must complete at least 15½ units of graduate work. The candidate must spend at least four semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in two full-time academic years of study.

Master of Architecture (One-Year Graduate Program). Applicants who hold the five-year Bachelor of Architecture degree are considered to have earned their first professional degree. For these students, a one-year professional degree program has been developed emphasizing further study in depth of one optional area of concentration, and/or participation in research identical to the final phase of the two-year graduate program.

A candidate admitted to the one-year graduate program must complete at least 8 units of graduate work. The candidate must spend at least two semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in one full-time academic year of study.

Master of Architecture (Three-and-One-Half–Year Graduate Program). The three-and-one-half–year professional degree program has been designed for those applicants who have a bachelor's degree in any field other than architecture. Emphasis is placed on the development of sufficient background in introductory architectural studies so that the applicant may successfully complete the equivalent of the two-year graduate program described above.

Applicants accepted into the three-and-one-half–year program will initially be admitted with limited standing. Full standing may be attained by completion of introductory architectural studies and acceptance into the two-year graduate program (see admission criteria).

The time necessary to complete the program will depend upon the nature of undergraduate course work completed by the applicant, any professional work experience, and the architectural specialization selected.

Master of Architecture and Master's Degree in Business Administration, Real Estate, and Computer Applications. Three joint master's degree programs related to the Architectural Management Option prepare graduate degree candidates for the broad range of management activity now developing in modern architectural practice. Building on the comprehensive foundation established in a baccalaureate degree program, these joint master's programs offer academic work in three additional areas of architectural finance and in computer applications. Work in the Architectural Management Option in one of these areas can lead to one of the following joint master's degree combinations: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Finance (real estate, investment, etc.; and Master of Architecture and Master of Computer Science.

For entry into these programs, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission may be

made simultaneously to both units or admission to the one unit may be sought after gaining entry to the other.

A candidate entering the joint degree program with a four-year baccalaureate in architectural studies must complete at least 21½ units of graduate work and, if admitted with full standing, may complete the program in the condensed time span of five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in the condensed time span of four semesters.

Master of Architecture and Master of Urban Planning. This joint degree program offers an opportunity to obtain an education for careers which combine and integrate the disciplines of architecture and planning. The program requires a match-up of related subject areas from each department in order to meet the requirements for each degree. These areas include: housing/community development, preservation/preservation planning, and urban design/environmental planning and land use. For entry into this program, the applicant must satisfy the admission requirements of each academic unit. Application for admission may be made either simultaneously to both units or in sequence.

A candidate entering the program with a four-year baccalaureate in architectural studies must complete at least 20½ units of graduate work and, if admitted with full standing, may complete the program in a condensed time span of six semesters and one summer session. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work, and, if admitted with full standing, may complete the program in the condensed time span of four semesters and a summer session.

Master of Architecture and Master of Civil Engineering (Construction Management). This joint degree program offers to qualified applicants the opportunity to develop competence in a career which combines the disciplines of architecture and civil engineering construction management. For entry into this program, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission may be made simultaneously to both units, or admission to the one unit may be sought after gaining entry to the other.

A candidate entering the program with a four-year baccalaureate in architectural studies must complete at least 21½ units of graduate work, and, if admitted with full standing, may complete the program in the condensed time span of five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete 16 units of graduate work, and, if admitted with full standing, may complete the program in four semesters.

ART AND DESIGN

(Including Art Education, Art History, Ceramics, Glass, Graphic Design, Industrial Design, Metals, Painting, Photography, Printmaking, and Sculpture)

Director: E. C. WICKS

Correspondence and Information: G. W. Hardiman, Coordinator of Graduate Programs, School of Art and Design, University of Illinois at Urbana-Champaign, 120 Art and Design Building, 408 East Peabody Drive, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: P. FEHL, D. FRITH, F. GALLO, L. GRUCZA, F. GUNTER, G. W. HARDIMAN, J. KAUFMAN, K. LANSING, N. MCFARLAND, B. NETTLES, D. PILCHER, D. ROWAN, J. SAVAGE, R. STERKEL, E. C. WICKS, E. ZAGORSKI, T. ZERNICH, J. ZIFF

Associate Professors: R. F. BLAKLEY, D. BUSHMAN, W. CARLSON, J. FINEBERG, S. FLACK, M. FRANCISCONO, A. GLAZE, H. MAGUIRE, C. MARTENS, K. MUNAKATA, J. RASCHEFF, D. SOCHA

Assistant Professors: J. GASSISI, A. HEDEMAN, C. JORDAN, A. METTE, S. ORSO, B. SLETTEN, A. TYLER, A. USHENKO, T. VAN LAAR

Graduate Degree Programs. The School of Art and Design offers the Master of Arts in Art Education and in Art History, the Master of Fine Arts, the Doctor of Education in Art Education, and the Doctor of Philosophy in Art History. The Graduate College admission requirements apply for all programs.

Master of Arts in Art Education. The program of study leading to the degree of Master of Arts in Art Education is designed to provide advanced professional preparation for art teachers and supervisors. A minimum of 8 units of study is required for the degree. Three units must be taken at the 400 level, all of which must be in art education graduate seminars. In addition to professional courses in art education, students may elect course work in drawing, painting, sculpture, printmaking, photography, cinematography, ceramics, glassworking, metalsmithing, and art history. Specific course selection is determined in consultation with the student's adviser. While the majority of applicants to this program hold valid teaching certificates, applicants with certification-related deficiencies may be admitted to the program. However, graduate credit cannot be granted for courses taken to make up such deficiencies. Candidates must spend at least two semesters or the equivalent in residence; however, applicants currently employed as teachers may apply for residence credit for summers only enrollment. No thesis is required.

Master of Arts in Art History. This program provides basic preparation for teaching at the college level, background in the history of art for museum work, and preliminary study for the doctoral degree. In addition to the general requirements, the prerequisite for admission is ordinarily an undergraduate degree in art history or a strong preparation in related humanistic studies. Applicants with little background in art history but who have done exceptionally well as undergraduates in other disciplines will be seriously considered. A minimum of 8 units is required for the degree. At least 6 units must be in the history of art and architecture, of which at least 4 units must be in art history graduate seminars. For those interested in art museum training, special courses in museology are offered by the staff of the Krannert Art Museum. Proficiency in French or German must be demonstrated by the end of the first year of residence. Before the degree is conferred, the candidate is required to pass an examination on the general field of art history. A thesis is required.

Master of Fine Arts. The degree of Master of Fine Arts in Art and Design with fields of specialization in ceramics, glass, graphic design, industrial design, metals, painting, photography, printmaking, and sculpture is designed to prepare qualified individuals for distinctive achievement in the professional area of their choice. Applicants should clearly indicate their intended specialization on their application for admission. A minimum of 16 units of graduate credit is required for the M.F.A. degree. Individual studio space and specialized resources and materials essential to the acquisition of a high-quality professional education are available to students in all areas of study. A graduation exhibition of creative work is required. Candidates must spend a minimum of four semesters or the equivalent in residence.

Doctor of Education in Art Education. The program leading to the degree of Doctor of Education in Art Education is designed to prepare qualified art educators for careers in college-level teaching and research. An applicant for admission must hold a master's degree in art education or the equivalent from an accredited institution. A minimum of two years of acceptable teaching experience is required. Admission is determined by examinations, personal interviews, records of previous education and experience, and letters of recommendation. Applicants should present credentials well in advance of their first registration. A minimum of 16 units of course work beyond the master's degree is required.

Doctor of Philosophy in Art History. The program leading to the degree of Doctor of Philosophy in Art History is designed to prepare students for scholarship and for teaching at the college level. Applicants must have the Master of Arts degree in Art History or the equivalent. Students earning the master's degree at the University of Illinois must pass the qualifying examination with a high score and write a thesis or research paper of superior quality in order to be admitted to the doctoral program. Students taking the master's degree elsewhere must satisfy the Graduate Committee

on the History of Art and Architecture as to their fitness to undertake work on a doctoral level. All students must have a reading knowledge of French and German. Students normally elect to specialize and write a thesis in one of the following fields: medieval, Renaissance, baroque, modern, or oriental. In addition, the student will elect a minor in another art history field.

Financial Aid. Fellowships, assistantships, and tuition and service fee waivers are awarded each year on a competitive basis with consideration given to the applicant's grade-point average and, in the case of applicants for the M.F.A. programs, quality of creative work.

Resources. Resources for the graduate student in art and design include the Krannert Art Museum's excellent permanent collections and changing exhibitions; the Ricker Art Library, one of the largest art and architecture libraries in the nation; the Krannert Center for the Performing Arts; and a variety of lectures, symposiums, musical programs, dramatic productions, and other cultural events associated with a large and progressive university.

ASIAN STUDIES

(Including Arabic, Burmese, Chinese, Hebrew, Indonesian, Japanese, Korean, Sanskrit, Thai, and Turkish)

Correspondence and Information: East Asian, Southeast Asian, and Pacific Studies: Center for East Asian and Pacific Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801
South and West Asian Studies: Program in South and West Asian Studies, University of Illinois at Urbana-Champaign, Room 381, Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. Balgopal, E. Bruner, C. Cheng, S. Cohen, R. Crawford, C. Cunningham, C. E. Dawn, L. Eastman, P. Ebrey, E. Giles, F. Gottheil, H. Gould, K. Gould, T. Hymowitz, N. Jacobs, B. Kachru, Y. Kachru, B. Karsh, M. Kenstowicz, C. Kim, B. Kling, F. Lehman, S. Makino, A. Neghandi, B. Nettl, D. Plath, S. Sato, P. Schran, C. Stewart, K. Taira, G. Tikku, H. Wechsler, M. Weinbaum, W. Wong, G. Yu, L. Zgusta

Associate Professors: B. Bognar, R. Chang, P. Cole, S. Douglas, H. Hock, R. Jennings, W. MacDonald, C. Mulhern, K. Munakata, J. Peterson, G. Porton, T. Riley, M. Shorish, K. Southwood, R. Toby, M. Wagner, M. Weinstein

Assistant Professors: A. Anagnost, C. Capwell, J. Dougherty, D. Goodman, P. Gregory, R. Pandharipande, G. Pope, M. Saul

Graduate Degree Program. The Center for Asian and Pacific Studies administers, in cooperation with the Program in South and West Asian Studies where applicable, a two-year program of language and area courses leading to the Master of Arts degree with regional concentrations in East Asia, Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for those intending to proceed to the Ph.D. degree in a related field and for those preparing for careers not requiring the doctorate. The Center for Asian Studies also administers a graduate minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, Middle East, South Asia, and Southeast Asia, or a combination of two or more of these areas.

Admission. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois at Urbana-Champaign, but final selection is determined by a committee of center faculty. Students whose native language is not English must score at least 580 on the

TOEFL to be eligible for admission at full graduate standing. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. Those entering without any prior training or experience, however, may be required to take, without credit toward the degree, such work as the adviser may deem necessary to make up any deficiencies.

Master of Arts. A candidate must complete 9 units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by satisfactory completion of an examination or appropriate course work, pass an oral examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers. No thesis is required.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least 2 units of graduate credit in approved courses in at least two departments outside the major department.

A doctoral candidate who elects Asian studies as a minor must earn at least 4 units of graduate credit in approved courses in at least two departments outside the major department. Also, prior to the completion of course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Head of the Department: RONALD J. ALLEN
Correspondence and Information: Head, Department of Astronomy, University of Illinois at Urbana-Champaign, 341 Astronomy Building, 1011 West Springfield Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. J. ALLEN, R. M. CRUTCHER, J. R. DICKEL, I. IBEN, JR., J. B. KALER, F. K. LAMB, D. MIHALAS, T. CH. MOUSCHOVIAS, E. C. OLSON, L. L. SMARR, L. E. SNYDER, G. W. SWENSON, J. W. TRURAN, W. D. WATSON, R. F. WEBBINK, K. M. YOSS
Assistant Professor: B. MIHALAS
Professors Emeriti: J. H. CAHN, S. ROSEN

Graduate Degree Programs. The Department of Astronomy offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The goal of the graduate program in astronomy is to provide broadly based training in modern astrophysics and astronomy for a small and carefully selected student body. Individually designed programs involving close contact with faculty members are encouraged, and an understanding of fundamental principles and techniques and their applications to research problems of current interest is emphasized. Students are expected to acquire a solid knowledge of modern physics as well as of general astronomy. A major objective is to maintain an exciting intellectual environment in which students can develop their scientific creativity and their enthusiasm for astronomy.

Admission. Admission decisions are made once a year in the spring. Applications for admission and financial assistance must be received by February 15. Normal entrance requirements are a bachelor's degree in astronomy, physics, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. A minimum grade-point average of 4.0 (A = 5.0) and satisfactory scores on the Graduate Record Examination (verbal, mathematics, and advanced physics portions) are requisites for admission. The award of financial assistance normally requires an average of higher than 4.5.

Master of Science. Eight units of study in graduate courses are required. There are no thesis or foreign language requirements. The 8 units of course work may be distributed as follows: all units taken in astronomy or 4 units selected from approved

courses in physics and mathematics and the remaining units from astronomy courses. At least 3 units must be at the 400 level.

Doctor of Philosophy. The Ph.D. degree requires completion of 16 units beyond the master's degree in courses in astronomy and related fields (some of which may involve individual study and research), satisfactory performance on a general qualifying examination taken no later than the beginning of the third year of study, demonstrated reading ability in one foreign language useful for astronomical work, and completion of an original research project culminating in a thesis that is publishable in whole or in part.

Financial Aid. University Fellowships are available and may be combined with part-time teaching assistantships. Most resident students are supported for their first two or three years by half-time teaching assistantships (starting salary $7,400 per academic year in 1985-86). The typical teaching assistant takes three graduate courses per semester and spends twenty hours per week handling quiz sections in elementary astronomy courses. Teaching assistantships are responsible positions, and the concomitant duties are considered to be a valuable part of the student's educational experience. Advanced students may compete for research assistantships offered by faculty members whose research is partially supported by federal grants.

Faculty Research Interests. Research activity includes observational and theoretical investigation of the solar system (comets, planets, cosmochronology); stars (stellar structure and evolution, gravitational collapse, nucleosynthesis, novae, supernovae, stellar atmospheres, binaries, stellar statistics, pulsars); the interstellar medium (planetary nebulae, molecular clouds, cosmic rays, supernova remnants, galactic structure); and extragalactic systems (galaxies; their structure, evolution, and dynamic behavior; quasars).

Astrophysics is also a strong research interest of about six faculty members in the Department of Physics. Current activity in physics centers on the physics of neutron stars, white dwarfs, compact X-ray sources, and supernova ejecta, with broad-ranging interests in the application of modern physics to astronomy. Students in astronomy may select thesis supervisors in the Department of Physics as well as in the Department of Astronomy.

Research Facilities. A 40-inch diameter reflecting telescope is located on Mt. Laguna in Southern California. It is operated jointly with San Diego State University which also operates 16-inch and 24-inch telescopes occasionally used by University of Illinois faculty and students. The Department of Astronomy supplies transportation costs to and from California. The department also purchases time on larger optical and radio telescopes operated by other universities. Both optical and radio astronomers frequently obtain observing time on telescopes at national observatories at Kitt Peak, Cerro Tololo, Green Bank, and Socorro. Computations are performed on an IBM 360/75, a CDC CYBER 175, and a CYBER 174 accessed via remote terminals in the Department of Astronomy. Simultaneous time sharing and batch processing with unusual speed are features of the computational system, which is among the most advanced university-based systems in the nation. A Vax-based interactive image processing system is available which greatly enhances the ability of both observers and theoreticians to analyze their raw data quickly. The department has access to the CRAY X/MP at the National Center for Supercomputing Applications on the campus; this computer is used for production data processing (radio synthesis imaging) as well as theoretical modeling.

ATMOSPHERIC SCIENCES

Head of Department: Y. OGURA

Correspondence and Information: Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, 6-109 Coordinated Science Laboratory Building, 1101 West Springfield Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M.-K. Mak, Y. Ogura, T. Sasamori, R. G. Semonin, K. E. Trenberth, J. E. Walsh, R. B. Wilhelmson
Associate Professors: K. V. K. Beard, P. J. Lamb, S.-T. Soong
Assistant Professors: J. R. Anderson, K. P. Bowman, J. R. Gyakum

Graduate Degree Programs. Graduate programs leading to the Master of Science and Doctor of Philosophy degrees are offered.

Admission. Applications for admission to this program must satisfy the general requirements for admission to the Graduate College. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied mathematics. There is no foreign language requirement.

Master of Science. The requirements for the degree of Master of Science in Atmospheric Sciences correspond to the general requirements of the Graduate College for the M.S. degree with the additional requirement of a minimum of 4 units to be taken in graduate courses in atmospheric sciences, excluding the thesis (499). Therefore, the total requirements are 8 units, 3 of which must be from courses numbered in the 400 series and 4 of which must be in atmospheric sciences. A written thesis, which may account for 1 or 2 units of credit, is also required. Further information on exact degree requirements can be obtained from the department.

Doctor of Philosophy. All candidates for the Ph.D. degree must satisfy the general requirements of the Graduate College and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet which may be obtained from the department.

Financial Aid. Financial aid is available in the form of research and teaching assistantships, University Fellowships, and waivers of tuition and service fees.

Research Interests. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the physics of aerosol and precipitation; precipitation chemistry; observational, theoretical and modeling studies of clouds and severe storms; synoptic and mesoscale meteorology; numerical weather predictions; weather modification; monsoonal circulations; polar meteorology and sea-ice forecasting; tropical meteorology; general circulation; climate and climate changes; urban climate; atmospheric turbulence and boundary layers; atmospheric radiative processes; ozone climatology; satellite meteorology; and crop yield–weather relationships.

Research Facilities. Current weather information is available for teaching and research. Weather facsimile charts are received continuously from the National Weather Service, and satellite imagery is received hourly through the department's UNIFAX II GOES receiver. The department also receives current surface and upper air data in digital form. This data is processed and stored on a state-of-the-art graphics and image system so that both students and faculty can retrieve and display them as they desire using interactive display programs. The system, built around a VAX 11/780, can also be used to display research data generated by numerical models or taken in special observational programs. For example, the COMTAL Vision One/20 can be used to display images obtained from radar, satellites, and models. The COMTAL has a built-in LSI-11 minicomputer to perform simple image processing such as adding or zooming images. Further, images on the COMTAL can be enhanced using color, and subtle changes in data can be clearly located. Copies of the images created may be obtained using a sophisticated color camera into which the video signal is directly fed. Several graphics terminals are also available, including a Tektronix 4025 and a high-resolution (4096 x 4096 points) Tektronix 4014. Hard copy can be made using a line printer, drum plotter, or printer/plotter. In addition, hard copy and film can be digitized for further processing.

Students and faculty have access to several other computer systems through the VAX 11/780 and terminals located within the department. The campus computing system provides a number of services through the powerful campus computers. In addition, the computing facilities at the National Center for Atmospheric Research located in Boulder, Colorado, can be used over telephone lines. The Center maintains several of the most powerful computers currently built and has comprehensive atmospheric data banks for support of research.

BUSINESS ADMINISTRATION

Head of the Department: LOUIS R. PONDY

Correspondence and Information: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: C. BLAIR, R. V. EVANS, D. M. GARDNER, R. M. HILL, H. HINOMOTO, J. KINDT, J. K. MURNIGHAN, A. NEGANDHI, G. OLDHAM, L. R. PONDY, W. J. PRIMEAUX, D. M. ROBERTS, K. M. ROWLAND, G. R. SALANCIK, J. N. SHETH, S. SUDMAN, H. THOMAS, D. W. WHETTEN, F. W. WINTER

Associate Professors: R. ENGELBRECHT-WIGGANS, A. HUFF, H. LEBLEBICI, J. PORAC, C. SCHWENK

Assistant Professors: A. BASU, L. BUCHANAN, I. DUHAIME, M. HASTAK, K. R. KUMAR, M. LYLES, Z. RITZ, D. SAMSON, J. P. SHAW, D. SUDHARSHAN, N. SUZUKI, M. TANG

Graduate Degree Programs. The Department of Business Administration offers graduate programs leading to the degrees of Master of Business Administration, Master of Science in Business Administration, and Doctor of Philosophy in Business Administration. The department also offers, in cooperation with other departments and colleges, a variety of interdisciplinary programs leading to such combined degrees as the Juris Doctor and Master of Business Administration, the Master of Architecture and Master of Business Administration, and the Bachelor of Arts (or Science) and the Master of Business Administration for superior undergraduates. Additional joint degree programs are the Master of Science in Electrical Engineering and Master of Business Administration, the Doctor of Medicine and Master of Business Administration, and the Master of Arts in Public Administration and Master of Business Administration and the Master of Computer Science and Master of Business Administration.

Admission. Graduate admission depends on many factors relating to demonstrated academic competence and potential of candidates. Our students are among the top 10 percent of all United States undergraduates scoring on the national Graduate Management Admission Test (GMAT) for management schools; their grade-point averages rank even higher, and about half have had full-time work experience. Persons seeking admission should have completed one year of college-level courses in calculus or be prepared to take a noncredit mathematics course upon entering the program. In general, admission is based on a person's (1) previous academic accomplishment; (2) demonstrated potential as indicated by performance on the Graduate Management Admission Test; (3) statement of professional and academic goals; and (4) letters of recommendation from professors, supervisors, or colleagues. Undergraduate majors can be from any area of study; more than half of our students have a nonbusiness background.

Master of Business Administration. The M.B.A. degree is designed as a general degree, preparatory to assuming administration positions, to be integrated with other technical and professional skills. The program requires 16 units, which can be completed in four semesters. The program may be started only in the fall term.

The program has three components: administrative foundations, managerial

functions, and professional concentrations. Course work involving the foundation and functional courses may be exempted provided additional electives are substituted. Professional concentrations may be elected from any curriculum in the University which is administratively justifiable or within a joint degree program. Students are also required to demonstrate computer competency, either by previous course work or by completing a noncredit workshop.

Foundations. Six courses form the theoretical grounds for the M.B.A. program. These include quantitative methods (statistics and operations research), behavioral and social science (human and organizational behavior), and economics (managerial and macroeconomics).

Functions. Six courses introduce the functional areas of management in most modern organizations. The functional area courses include: marketing, managerial accounting and control, financial management, operations management, business law, and strategic management. These courses are designed as overviews and do not substitute for concentrated technical or professional education in each area.

Concentrations. Four courses are elected by students to integrate, develop, and refine their management interests. Students from joint degree programs take their concentrations in their specialty areas — law, architecture, medicine, engineering, or public administration. Other students concentrate in such business areas as finance, international marketing, managerial accounting, consumer and industrial marketing, organizational development, and management information systems.

Master of Science in Business Administration. The Master of Science in Business Administration is a 12-unit master's program. The focus is on preparation for advanced study in the doctoral program or for a technical or research position in industry or government. The course work can usually be completed in one-and-a-half years.

The program core for this degree consists of fundamental courses in statistics, operations research, human and organizational behavior, managerial economics, macroeconomics, and managerial accounting. Four courses that will constitute the major area of specialization are to be chosen from management science, organizational behavior, management information systems, operations management, marketing, international business operations, business economics, and strategic management and policy. Two courses that will constitute a minor area can be independent research courses or relevant courses offered within or outside the department. A thesis may be prepared in place of the two courses.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration. Doctoral students can specialize in marketing, organizational behavior, decision and information sciences, international business, business economics, and strategic management and policy. The program is intensive, flexible, and adapted to individual needs.

Each student's program entails sufficient study and preparation to achieve the following: (1) competence in a common core covering substantive and research methods courses which are formulated by the faculty in each area; (2) in-depth expertise in a major area; (3) expertise in at least one area in addition to the chosen major area, with this minor area selected from within or outside the department; (4) teaching competence; (5) research or problem-solving competence.

Competency is determined by comprehensive written and/or oral examinations. Following successful completion of all course work and comprehensive examinations in major and minor areas, the student must propose and gain approval of a thesis topic at a public colloquium. The final program requirement is the successful oral defense of the thesis.

For persons entering the program from an undergraduate program, the minimum requirements are 16 course units and 8 thesis units. Persons entering with a master's degree in business generally will need a minimum of 8 course units and 8 thesis units. The program usually is completed in four years, although students with a master's degree in business may require only three years.

Juris Doctor and Master of Business Administration Program. This program, leading to the J.D. and M.B.A. degrees in four years, is designed to provide training for careers in which administration and law significantly overlap. To enter the program, a person must apply separately and be admitted to both the College of Law and the Department of Business Administration. The policies of each with respect to degree requirements, grades, examinations, and other academic requirements for graduation are applicable.

During the first two years, the student takes the first-year law curriculum in one year and the first-year business administration curriculum in the other. The student takes courses in both colleges during the third and fourth years. The program requires a student to take a minimum of 74 hours of law courses and 11 units (equivalent to 44 semester hours) of business administration courses.

Master of Architecture and Master of Business Administration. This program is designed to provide training for careers in which management and architecture overlap. Applicants to the program must be admitted to both the School of Architecture and the Department of Business Administration. One application form and one fee are required. The policies of each department with respect to degree requirements, grades, examinations, and other academic requirements for graduation are applicable.

This double master's program enables the student taking a full load each semester and with normal progress to fulfill the requirements for both degrees by completing a total of 21½ units in five semesters.

Other Joint Degree Programs. In addition to law and architecture, the department offers several other professional programs which enable students to prepare for two professional areas simultaneously. The Master of Science in Electrical Engineering and Master of Business Administration program, leading to the separate degrees of M.S.E.E. and M.B.A., is designed for careers in public service and professional engineering offices or careers in business which require working extensively on engineering applications. The normal degree requirements of 16 units for the M.B.A. degree and 8 units for the M.S.E.E. degree are reduced by a total of 6 units through an exchange of credits between departments. For information on the M.S.E.E. program, write to Head of the Department, Department of Electrical Engineering, 155 Electrical Engineering Building, 1406 West Green Street, Urbana, Illinois 61801.

The Medical Scholars Program, leading to the separate degrees of M.D. and M.B.A., is designed for the medical doctor who anticipates administrative and management responsibilities. In addition to the requirements for the M.D. degree, the program requires 12 units from business administration. The program can be completed over four full years (including three summers). For information on the program, write Coordinator, Medical Scholars Program, College of Medicine at Urbana-Champaign, University of Illinois School of Clinical Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

The Master of Computer Science and the Master of Business Administration program is designed for computer scientists who want to be professional managers. The joint program allows students to earn both degrees in three years. Additional information about the program is available from the Head of the Department, Department of Computer Science, 1304 West Springfield Avenue, Urbana, Illinois 61801.

In the Bachelor of Arts (or Bachelor of Science) and Master of Business Administration program, the College of Commerce and Business Administration, the College of Liberal Arts and Sciences, and the Graduate College have created a joint baccalaureate and M.B.A. degree program. Qualified students earn both bachelor's and M.B.A. degrees within five years. Undergraduate and professional education are integrated through careful course planning beginning in the sophomore year. The student applies to the program during the junior year. During the fourth year, students complete required M.B.A. graduate courses as electives for their baccalaureate program.

International Programs. The department has worked with various language and

social science faculty members to design master's and doctoral program options which address education for the growing internationalization of business. These are suited particularly for undergraduates prepared in foreign languages and cultures, international economics, and politics. For example, M.B.A. candidates may be eligible to receive a Certificate in International Business.

Residence Requirement. Master's degree candidates usually must maintain continuous full-time registration through to course work completion. Ph.D. candidates must maintain continuous registration through approval of a dissertation proposal. Leaves of absence for up to one year are permitted under extenuating circumstances with Graduate College and departmental approval.

Financial Aid. Financial assistance is available through nonservice awards such as fellowships and/or tuition and fee waivers; service awards, such as teaching and research assistantships; work-study programs; and loans. Application can be made on admission applications filed by February 15. Nonservice awards are made by the Graduate College based on scholarly and creative achievement and promise. Service awards are selected by the Department of Business Administration with approval of the Graduate College.

Research Interests. Faculty research interests are in the areas of marketing, organizational behavior, decision and information sciences, strategic planning and business policy, international business, accounting, economics, entrepreneurship, and finance. The College of Commerce and Business Administration houses computer facilities, a behavioral science laboratory, and a separate library, and maintains contacts with industry and government through its Executive Development Center, Executive in Residence Program, Survey Research Laboratory, Bureau of Economics and Business Research, and several professional and scholarly journals edited by its faculty.

CERAMIC ENGINEERING

(Including Ceramic Science)

Head of the Department: C. G. BERGERON

Correspondence and Information: Head, Department of Ceramic Engineering, University of Illinois at Urbana-Champaign, 203 Ceramics Building, 105 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. L. BERGER, C. G. BERGERON, S. D. BROWN, R. C. BUCHANAN, J. A. NELSON, D. A. PAYNE, W. S. WILLIAMS, J. F. YOUNG

Associate Professors: M. K. FERBER, W. M. KRIVEN, S. H. RISBUD, S. I. STUPP, G. P. WIRTZ

Assistant Professors: S. GRANICK, J. HOMENY

Adjunct Professor: M. BERG

Graduate Degree Programs. The Department of Ceramic Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees in two areas, ceramic engineering and ceramic science. The ceramic engineering program provides instruction and research related to the applied engineering science of ceramic materials, processing, and products. Candidates in this area of graduate work are usually those who have completed an undergraduate degree in engineering. The program in ceramic science is more concerned with basic science, and candidates may come from nonengineering disciplines such as chemistry, physics, or geology.

Admission. The minimum acceptable admission average is 4.0 (A = 5.0) on the advanced undergraduate academic work of the candidate and on any previous graduate work completed. Letters of reference are also used in making the departmental recommendation on admission. For international students, the minimum acceptable TOEFL score is 575. Graduate Record Examination scores are not required.

Master of Science. The candidate for the Master of Science in Ceramic Engineering

or in Ceramic Science must complete a minimum of 8 units of graduate work including a thesis. Five units of course work are required, including 3 units of ceramic engineering 400-level courses, excluding Ceramic Engineering 495, 497, and 499. Ceramic Engineering 401 and 412 are required in the three 400-level units.

Doctor of Philosophy. The minimum requirement for the Ph.D. degree is 16 units beyond the master's degree, including thesis units. Doctor of Philosophy candidates whose undergraduate degree was not earned in ceramic engineering or in ceramic science are required to complete seven ceramic engineering 300- or 400-level courses. Candidates are required to complete first the master's thesis or give evidence of equivalent research experience. They must also pass the departmental qualifying examination. There is no foreign language requirement. Minor requirements are satisfied by courses in chemistry, physics, mathematics, geology, or other engineering disciplines. Students majoring in chemistry, physics, engineering, and in certain other fields may take one or two minors in ceramic science or ceramic engineering.

Financial Aid. Candidates for graduate degrees may be supported through assistantships, fellowships, or waivers of tuition and service fees. Assistantships for research or teaching provide for a monthly stipend plus waiver of tuition and service fees. Fellowships require no work commitment and also pay a monthly stipend plus a waiver of tuition and fees. Awards for financial assistance are based principally on the candidate's academic record, statement of plans, and letters of reference.

CHEMICAL PHYSICS

Head of the Department of Chemistry: JIRI JONAS
Head of the Department of Physics: RALPH O. SIMMONS
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head of the Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head of the Department of Physics, University of Illinois at Urbana-Champaign, 211 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois 61801.

Graduate Degree Programs. A chemical physics program leading to the Doctor of Philosophy makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Fundamental research on many properties of molecular and solid state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission. Graduate College admission requirements apply. To be considered for admission, applicants should have undergraduate degrees in chemistry or physics with a strong background in the major field of chemistry or physics and more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study.

Doctor of Philosophy. In addition to taking a series of appropriate courses determined mainly by their research interests, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). In addition, students must pass an oral preliminary examination concerned with their preparation for doing research. Research for the thesis is performed under the direction of faculty who are currently active in chemical physics. Many of these

staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from the Departments of Physics, Chemistry, Metallurgy, Ceramic Engineering, Electrical Engineering, and other related departments who have common interests in materials science.

Financial Aid. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School: JIRI JONAS
Associate Director of the School: JOHN P. HUMMEL
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of Master of Science and Doctor of Philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments and yet retain the advantages of a common approach to overlapping concerns. Service facilities, technical shops, and a placement office are provided by the school. Support for graduate training is available in the form of assistantships, traineeships, and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department or from the director of the school.

Biochemistry

Head of the Department: LOWELL P. HAGER
Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 415 Roger Adams Laboratory, 1209 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. M. CLARK, JR., H. E. CONRAD, R. B. GENNIS, M. GLASER, L. P. HAGER, A. JONAS, D. J. SHAPIRO, R. L. SWITZER
Associate Professors: R. I. GUMPORT, G. W. ORDAL, S. G. SLIGAR
Assistant Professors: J. A. KAPUT, G. N. PHILLIPS, JR., M. A. SCHULER, J. WIDOM, J. A. WISE

Graduate Degree Programs. The Department of Biochemistry offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees.

Admission. Admission to the M.S. and Ph.D. programs is limited to graduates with bachelor's degrees equivalent to those of the University of Illinois at Urbana-Champaign. Admission is generally limited to undergraduates who have basic backgrounds in organic and physical chemistry, in biology, and in mathematics through calculus. Students lacking such background may be required to obtain it during the course of their graduate study. Admission is also generally limited to students with undergraduate grade-point averages of 4.2 or higher (A = 5.0). For admission, students must have at least a 4.0 average for the last 60 hours of undergraduate work, or the last 60 hours of undergraduate work and total accumulated graduate work, whichever is appropriate.

Master of Science. The Master of Science in Biochemistry may be completed with or without a thesis. A course-work master's degree requires a minimum of two full-time semesters and involves 8 units of formal lecture and laboratory course work,

with at least 3 of those units in 400-level courses. A Master of Science degree with thesis usually requires a minimum of three semester's work, and 3 of the 8 required units may be thesis research.

Doctor of Philosophy. The Ph.D. candidate in biochemistry must pass an oral research qualifying examination within the first eighteen months of residency and successfully complete a series of written cumulative examinations. Four-and-one-half units of biochemistry course work and 3½ units of advanced elective course work are required. A thesis based on original research must be presented to a review committee at least two weeks before the final examination. The final examination is limited to a defense of the thesis research. The Ph.D. degree program usually takes four to five years for completion. Experience in teaching is considered a vital part of the graduate program and is required as a part of the academic work of all Ph.D. candidates in this department.

Financial Aid. Financial aid for graduate students in biochemistry is available in the form of traineeships, fellowships, and teaching and research assistantships. A training grant from the National Institutes of Health supports a multidisciplinary training program. The department usually supplements trainee stipends during the academic year with a quarter-time teaching assistantship for one semester and a 10-percent research assistantship in the other semester.

Chemical Engineering

Head of the Department: C. A. Eckert
Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 113 Roger Adams Laboratory, 1209 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. C. Alkire, H. G. Drickamer, C. A. Eckert, T. J. Hanratty, W. G. May, A. J. McHugh, J. W. Westwater
Associate Professors: M. A. Stadtherr, R. I. Masel
Assistant Professor: J. J. L. Higdon, C. F. Zukoski

Graduate Degree Programs. The Department of Chemical Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees. Those interested should write to the address above for application materials and a departmental brochure which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois at Urbana-Champaign. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with deficiencies to be removed to the extent prescribed by their advisers. Graduate College admission requirements also apply.

Master of Science. Requirements for the Master of Science include 8 units of graduate credit and a thesis. At least 5 of these units must be in courses other than thesis research; 2 of the 3 required 400-level units must be in chemical engineering courses.

Doctor of Philosophy. Requirements include 24 units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test normally taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: LARRY R. FAULKNER

Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. BEAK, R. L. BELFORD, T. L. BROWN, R. M. COATES, D. Y. CURTIN, H. G. DRICKAMER, L. R. FAULKNER, R. B. GENNIS, H. S. GUTOWSKY, G. P. HAIGHT, JR., D. N. HENDRICKSON, J. P. HUMMEL, J. JONAS, J. A. KATZENELLENBOGEN, W. G. KLEMPERER, P. C. LAUTERBUR, N. J. LEONARD, J. D. MCDONALD, E. OLDFIELD, I. C. PAUL, W. H. PIRKLE, K. L. RINEHART, G. B. SCHUSTER, D. H. SECREST, J. R. SHAPLEY, S. G. SMITH, P. G. WOLYNES, P. E. YANKWICH

Associate Professors: D. D. DLOTT, C. E. DYKSTRA, E. M. MELHADO, T. A. NIEMAN, T. B. RAUCHFUSS, K. S. SUSLICK, A. WIECKOWSKI

Assistant Professors: P. W. BOHN, C. A. BROKA, S. E. DENMARK, G. S. GIROLAMI, J. M. LISY, A. SCHEELINE, R. A. SCOTT, J. WIDOM, S. C. ZIMMERMAN

Graduate Degree Programs. The degrees offered in chemistry are Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. Attention is also called to a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 90) and to the programs in biophysics (see page 142).

Admission. Students who have fulfilled the usual undergraduate course requirements, including at least 25 properly distributed semester hours in chemistry, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. Students who have completed graduate work in chemistry at another institution may be considered for admission if they have averages of 4.0 (A = 5.0) in both undergraduate and graduate work, or if they have earned a 4.25 average in at least 8 units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the teaching of chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree.

Master of Science in the Teaching of Chemistry. Candidates for the Master of Science in the Teaching of Chemistry must earn 4 units of credit in chemistry, 2 units in education, and 2 units of electives in either education or physical science. The 2 units in education consist of courses in educational policy studies and educational psychology (see page 104). The courses in chemistry and the electives must be selected with the approval of the adviser. No thesis is required. Questions concerning the Teaching of Chemistry Program should be addressed to Professor D. H. Secrest, 155 Noyes Laboratory.

Master's Programs in Chemistry. Eight units of credit are required for the master's degrees. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A research thesis is optional. If a thesis is elected, 5 units of formal courses are required. If a thesis is not elected, an additional 3 units of formal courses are required. The course program in that case must include 3 units of 400-level courses, 2 of which must be in chemistry.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialities, including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. A total of 24 units including thesis credit is required. The formal course requirements involve 2½ to 3½ units of 400-level courses in the major area of interest and 2 to 3 units in allied areas or fields. Besides completing formal course work, the students are required to pass a series of written cumulative examinations, pass an oral preliminary examination on research preparation, and submit a thesis on original

research which is defended at a final oral examination. (Majors in organic chemistry must also demonstrate a reading knowledge of German.) Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

Financial Aid. Support for graduate students is available through fellowships and assistantships. All candidates are considered for these upon application. Graduate students making normal progress toward their degree generally receive a tuition waiver, as well as a stipend.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering and Environmental Science in Civil Engineering)

Head of the Department: W. J. HALL

Correspondence and Information: Head, Department of Civil Engineering, University of Illinois at Urbana-Champaign, 1114 Nathan M. Newmark Civil Engineering Laboratory, 208 North Romine Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: W. C. ACKERMANN, A. H.-S. ANG, J. E. BAERWALD, E. J. BARENBERG, R. L. BERGER, D. E. BOYCE, L. T. BOYER, E. D. BRILL, A. B. CHILTON, E. J. CORDING, M. I. DARTER, B. J. DEMPSEY, R. S. ENGELBRECHT, R. A. EUBANKS, B. B. EWING, W. L. GAMBLE, E. H. GAYLORD, J. GHABOUSSI, G. R. GURFINKEL, W. J. HALL, J. D. HALTIWANGER, W. W. HAY, A. J. HENDRON, M. HERRIN, P. K. HOPKE, H. O. IRELAND, H. M. KARARA, C. E. KESLER, N. KHACHATURIAN, R. W. LARIMORE, F. V. LAWRENCE, J. C. LIEBMAN, L. A. LOPEZ, W. H. C. MAXWELL, J. W. MELIN, G. MESRI, R. J. MOSBORG, W. H. MUNSE, J. P. MURTHA, D. A. W. PECKNOLD, J. T. PFEFFER, A. R. ROBINSON, W. C. SCHNOBRICH, L. R. SHAFFER, C. P. SIESS, V. L. SNOEYINK, M. A. SOZEN, J. E. STALLMEYER, J. J. STUKEL, M. T. SUIDAN, W. H. TANG, M. R. THOMPSON, Y. K. WEN, H. G. WENZEL, K. W. WONG, B. C. YEN, J. F. YOUNG

Associate Professors: D. P. ABRAMS, S. H. CARPENTER, J. W. EHEART, D. A. FOUTCH, R. B. HABER, E. E. HERRICKS, C. W. IBBS, R. A. LARSON, S. L. PAUL, B. E. RITTMAN, W. H. WALKER

Assistant Professors: V. ALAVIAN, K. D. HJELMSTAD, K. H. LEONG, J. H. LONG, A. J. VALOCCHI

Graduate Degree Programs. The Department of Civil Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering, plus a joint degree, Master of Science in Architecture and Civil Engineering (construction option).

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution, aquatic ecology, computer-aided design, construction management, structural analysis and design, foundations, earthquake engineering, environmental engineering or environmental science in civil engineering, geodesy, highway materials, hydraulics and hydrology, liquid-solid waste management, materials engineering, nuclear shielding, ocean engineering, ocean structures, photogrammetry, stream and lake analysis, soil and rock mechanics, structural dynamics, structural mechanics,

probability and stochastic processes, systems engineering, transportation, and water resources. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois at Urbana-Champaign, provided the applicant's preparation is appropriate to advanced study in his or her chosen major field. For additional information, see the department pamphlet "Graduate Study and Research in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering." In general, a 4.0 grade-point average (A = 5.0) for the last 60 hours of the undergraduate program and for any previous graduate work is a minimum requirement for admission to the M.S. program. Requirements for admission to the Ph.D. program are variable, but are normally substantially higher. The Graduate Record Examination is not required, but is highly recommended.

Master of Science. A master's program may be completed in one full-time academic year of study. A candidate for the master's degree must complete at least 9 units without a thesis or 8 units with a thesis. In the latter case, credit is given for thesis work. Three of the units must be in courses numbered in the 400 series, and 2 of these 3 must be taken for grades in the major field. A total of at least 4 units must be in the major field. There are no specific course requirements; individual programs are developed by the student in consultation with his or her academic adviser. At least half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign campus, or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought. Although, under certain conditions, a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time, normally such students require an additional semester. There are no foreign language requirements in the M.S. program. The joint Master of Science with Architecture degree requires a minimum of 19½ units with a thesis and 20½ units without a thesis and can be completed in five semesters of full-time studies.

Doctor of Philosophy. The degree of Doctor of Philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. A minimum of 24 units beyond the bachelor's degree or 16 units beyond the master's degree is required. In accordance with Graduate College regulations, 16 units must be completed in residence. The major area of specialization encompasses courses and research which are closely related, but the courses need not necessarily be offered by a single major department. There is no department-wide foreign language requirement. However, the faculties of some areas of specialization may require foreign language proficiency, if essential to the conduct of research in that area. The candidate must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

Financial Aid. Financial aid is available in the form of fellowships, research and teaching assistantships, and tuition and service fee waivers.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Chairperson of the Department: D. F. BRIGHT

Correspondence and Information: Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. J. BATEMAN, D. F. BRIGHT, G. M. BROWNE, H. C. GOTOFF, H. JACOBSON, M. MARCOVICH, J. K. NEWMAN, W. R. SCHOEDEL, L. ZGUSTA

Associate Professors: J. A. DENGATE, H. H. HOCK, D. SANSONE

Graduate Degree Programs. The Department of the Classics offers graduate work leading to the Master of Arts in Classics, Latin, Greek, and the Teaching of Latin, and the Doctor of Philosophy in Classical Philology. Although the graduate program is designed to provide a thorough education in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including papyrology, Byzantine and Renaissance authors); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, ancient philosophy, and classical linguistics. A statement of "Regulations for Advanced Degrees in the Classics" and special programs for prospective secondary school teachers may be obtained from the department office.

Admission. In addition to meeting the admission requirements of the Graduate College, applicants for admission to graduate study in the classics curriculum must ordinarily present at least 20 hours in either Greek or Latin and 15 hours in the other language; candidates for admission to the Greek or Latin curriculum must ordinarily present at least 20 hours in that language. Previous work in ancient history, ancient art and archaeology, philosophy, literary criticism, or linguistics is also required.

Master of Arts. The Master of Arts may be taken in classics, Greek, Latin, or the teaching of Latin. Candidates for this degree must complete 8 units of course work. For the A.M. in Classics: 6 units of Greek and Latin, with at least 2 units in each language and at least 3 units at the 400 level (excluding 400-401); 2 units of electives; and sight-translation examinations in both languages. For the A.M. in Greek (Latin): 5 units in Greek (Latin) with at least 3 units at the 400 level; 3 units of electives; and sight-translation examination in Greek (Latin). With the consent of the student's adviser, up to 2 units of thesis may be counted toward elective credit for the A.M. in Classics, Greek, or Latin. For the A.M. in the Teaching of Latin: 4 units of Latin, including 3 units at the 400 level; 2 units of education courses; and 2 units of appropriate electives.

Doctor of Philosophy. The Doctor of Philosophy is offered only in classical philology, which requires advanced work in both Greek and Latin. Candidates for the Ph.D. program are eligible for acceptance upon completion of the master's degree or its equivalent. Once admitted, they must complete at least 16 additional units. These include 8 units of course work: 6 units in Greek and Latin, with at least 2 units in each language and at least 5 at the 400 level; and 2 units of appropriate electives. The department requires a reading knowledge of two ancillary languages, German and (usually) French. Knowledge of one of these should be demonstrated at the time of admission to Level II and the other before the start of the second year at Level II. The thesis carries 8 units of credit. Admission to the thesis level requires passing the written preliminary examinations (Greek and Latin sight-translation, history of Greek and Latin literature, and a special author) and the preliminary oral examination.

Financial Aid. Teaching assistantships and University Fellowships are available for the academic year and summer session.

Research Interests. Two periodicals are edited from within the department: *Illinois Classical Studies* and *Bulletin of the American Society of Papyrologists.*

Resources. The separate Classics Library has about 45,000 titles. The University of Illinois Library's Rare Book Room houses the Turyn Archive of Greek manuscript photographs and the American Center of the International Photographic Archive of Papyri.

COMMUNICATIONS

Dean of the College of Communications: JAMES W. CAREY
Chairperson of the Graduate Committee: HOWARD S. MACLAY
Correspondence and Information: Chairperson, Graduate Committee in Communications, University of Illinois at Urbana-Champaign, 222b Armory, 505 East Armory Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: W. F. Brewer, J. W. Carey, J. G. Delia, M. E. Fishbein, T. Guback, H. Maclay, R. Merritt, T. Peterson, K. B. Rotzoll
Associate Professors: C. Christians, L. G. Grossberg, W. D. Rowland, E. A. Wartella, D. C. Whitney
Assistant Professors: J. Nerone, P. Treichler
Professors Emeriti: J. W. Jensen, C. E. Osgood

Graduate Degree Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences, supported by the humanities, fine and applied arts, and natural sciences, to the basic problems of human communications. It is intended for students who plan careers in teaching such communications subjects as journalism, radio-television, and psycholinguistics; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Doctor of Philosophy. The Ph.D. program requires a minimum of 24 units beyond the bachelor's degree. Students working toward a Ph.D. degree normally require from three to five years to complete their work. A full-time student entering the program directly after receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a thesis. Full-time students entering with a master's degree should expect to take a minimum of one year of course work before embarking on the thesis. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the thesis. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism or Advertising or in one of the several departments in the social sciences.

COMPARATIVE LITERATURE

Director of the Program: A. Owen Aldridge
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A. O. Aldridge, W. Höllerer, F. Jost, H. Knust, J. Marchand, R. J. Nelson, G. Tikku
Associate Professor: M. Palencia-Roth
Assistant Professor: J. Smarr

Graduate Degree Programs. The Program in Comparative Literature offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy and is designed to provide a systematic study of subjects and problems common to several literatures. Its purpose is to enable students who have varied linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and the relations between literature and the other arts. The journal, *Comparative Literature Studies,* is sponsored by the program.

Admission. In addition to meeting the Graduate College admission requirements, a student entering the program should have an undergraduate major in English, the classics, or a foreign language. Majors in history and philosophy may be accepted with the special consent of the director of the program. For applicants to the Ph.D. curriculum, the A.M. will function as the qualifying test. Students entering with an A.M. degree from another university or from another department of this University will take the comparative literature component and a literary component of this program's regular Master of Arts examination at the end of the first year as a qualifying test.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages, as well as in English. Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or Neoclassicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the Program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for languages which may not be taught in regular departments.

The candidate must complete 8 units of credit, including a course in theory of literature (Comparative Literature 401) and three seminars in comparative literature selected from Comparative Literature 451, 461, 471, and 481, taught by members of the comparative literature faculty. The other 4 units should be taken in two or three national literatures in a distribution approved by the adviser; at least 5 of 8 units should be taken in courses at the 400 level. The candidate should pass a written examination based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text.

Doctor of Philosophy. A candidate for the Doctor of Philosophy degree must fulfill the general requirements of the Graduate College in addition to those specified above for the master's degree. Competency must be demonstrated in at least three foreign languages as well as in English. These three languages should coincide with those vital to the student's thesis and area of specialization. The candidate should choose at least 5 units from comparative literature seminars taught by members of the comparative literature faculty. Three additional units of work at the 400 level should be taken in courses regularly offered by the literature departments; among these, courses crosslisted with the Program in Comparative Literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student also selects a period of major interest and is responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be the Middle Ages, Renaissance, Neoclassicism, and the Enlightenment, or modern (nineteenth and twentieth centuries). Some chronological variations in coordinating the minors will be allowed for students concentrating on East/West relations. A preliminary examination, a four-part written examination based on the individual program, and an oral examination with emphasis on the thesis project must be passed. The candidate must present an acceptable thesis embracing several national literatures and pass a final oral examination on the thesis.

Financial Aid. A limited number of University Fellowships, tuition and service fee waivers, and teaching assistantships, in cooperation with other departments, are available.

COMPUTER SCIENCE

Head of the Department: C. W. Gear

Correspondence and Information: Academic Office, 114 Digital Computer Laboratory, Department of Computer Science, University of Illinois at Urbana-Champaign, 1304 West Springfield Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G. G. Belford, R. H. Campbell, M. Faiman, C. W. Gear, W. J. Kubitz, D. Kuck, D. H. Lawrie, A. Levy, C. L. Liu, J. W.-S. Liu, R. S. Michalski, D.

Muller, S. Muroga, D. A. Plaisted, W. J. Poppelbaum, S. R. Ray, E. M. Reingold, J. E. Robertson, A. H. Sameh, J. N. Snyder

Associate Professors: N. Dershowitz, H. G. Friedman, Jr., D. D. Gajski, M. D. Mickunas, P. E. Saylor, R. D. Skeel, D. S. Watanabe

Assistant Professors: W. Abu-Sufah, A. B. Baskin, G. C. Collins, H. Edelsbrunner, P. Emrath, K. D. Forbus, M. T. Harandi, R. Johnson, L. V. Kalé, S. N. Kamin, S. Kaplan, C. P. Kruskal, S. Kuck, K.-J. Lin, D. Padua, U. Reddy, D. Reed, L. A. Rendell, P. Yew

Graduate Degree Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science in Computer Science, Doctor of Philosophy in Computer Science, Master of Science in the Teaching of Computer Science, and a professional degree, Master of Computer Science. Areas of specialization include analysis of algorithms and theory of computation, combinatorics, computer-aided instruction, computer applications in physical and social sciences, computer networks, computer inference and machine learning, computer organization, design automation, digital computer arithmetic, digital systems design, display systems, hardware systems design, information retrieval, knowledge-based systems, microprocessor applications, numerical analysis, pattern recognition, programming languages, software systems, and switching theory.

Admission. Applicants must hold a bachelor's degree equivalent to that granted by the University of Illinois. Their grade-point average (GPA) for the last 60 semester hours (junior and senior years) of undergraduate course work must be at least 4.0 (A = 5.0). If they also hold a higher degree, their GPA for that, too, must be at least 4.0. They must submit their scores on the Graduate Record Examination (GRE) General Test. In addition, the following course background, while not mandatory, is strongly recommended: 10 semester hours of analytical geometry and calculus, 3 hours of linear algebra, 3 hours of probability and statistics, and an introductory computer science course involving programming in a block-structured language. Some promising applicants who lack a few of these requirements may be admitted on limited status, a classification that is removed once they demonstrate satisfactory progress toward their degree. In addition to these basic entrance requirements, applicants to the M.S. and Ph.D. programs should have had the equivalent of 20 semester hours in a related discipline including 12 hours in computer science. It is further strongly recommended that they submit scores for a GRE Subject Test; computer science is preferred, but another in a related field is acceptable.

A brochure giving more detailed information is available from the department's Academic Office.

Proficiency. Students admitted to the M.S, M.C.S. or Ph.D. programs must demonstrate proficiency in three (M.C.S.) or four (M.S. and Ph.D.) basic areas of computer science within their first year of graduate study. They may do so either by passing the departmental general examination offered at the beginning of each fall and spring semester or by satisfactorily completing selected courses from a list available in the departmental office. Two of the basic areas are software and computer organization. The other area or areas are chosen from: computer hardware, numerical analysis, and theory of computation.

Master of Science. The M.S. degree requires 8 units, of which at least 4 must be in computer science, and a thesis. Three or more units must be at the 400 level, of which at least 2 must be in computer science and 1 must be Computer Science 499 (thesis research). Full-time students may complete their M.S. degree in one year.

Master of Computer Science. This program does not lead to the doctorate and is designed for two groups of students. The larger group comprises students who enter without an extensive computer science background but nevertheless intend to become heavily involved with computers in their professional careers. The second group is that of students with computer science degrees who are interested in the application of computers to other professional or commercial activities. The M.C.S. degree

requires 5 core units in computer science, 4 units in a cognate area, and 4 units of individual study for which a report must be written.

Master of Science in the Teaching of Computer Science. The M.S.T.C.S. program is for prospective teachers of computer science at undergraduate colleges, junior colleges, vocational-technical colleges, and high schools. The M.S.T.C.S. degree requires 4 units in computer science, 2 in education, and 2 units in an area relevant to computer science education. Students are also required to complete a teaching project which may be satisfied in various ways, e.g., service as a teaching assistant, past or present employment as a high school or college teacher, practice teaching, or preparation of material for computer-aided instruction.

Doctor of Philosophy. Students admitted to the Ph.D. program must take the departmental qualifying examination by the end of their fourth semester (third semester, if admitted with an M.S. degree). This oral examination tests students' understanding of 300-level material that is relevant to their intended research areas. A student who fails may take the examination only one more time. The degree requires 16 course-work units (8 units if an M.S. degree has been completed), of which at least 6 must be in computer science, 8 units in thesis research, and a thesis. The preliminary examination is orally administered by a five-person doctoral committee at the onset of the student's research, and the same committee conducts the final examination when the thesis is complete.

DANCE

Head of the Department: PATRICIA K. KNOWLES
Correspondence and Information: Graduate Program, Department of Dance, University of Illinois at Urbana-Champaign, 4-501 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: B. BLOSSOM, P. K. KNOWLES
Associate Professor: W. WARD
Assistant Professors: P. BOSMAN, R. DICELLO, L. LAWRENCE-POWELL, D. SNYDER

(The resident faculty is augmented by visiting professional artists who teach advanced studio courses. The equivalent of one full-time faculty position is reserved for the Artist-in-Residence Program.)

Admissions. Prerequisites for admission are: (1) an undergraduate degree in dance comparable to that granted by the University of Illinois at Urbana-Champaign or equivalent experience (students who are deficient in undergraduate course work may be admitted but will be expected to make up any deficiencies) and (2) demonstrated advance technical skill and choreographic ability (candidates must pass a qualifying audition to confirm advance technical proficiency and to demonstrate facility in choreography).

Graduate Degree Program. The M.F.A. Program in Dance is a practice-oriented, terminal degree program for students in performance and choreography. Fourteen units and a minimum two-year (4 semester) residency are required for this degree. Course work taken to complete undergraduate deficiencies may increase the residency requirements to 5 or 6 semesters. A culminating creative project (Dance 498, 2 units) must be approved and accepted by the graduate faculty. Twelve units are required in the areas of technique, choreography, performance, production, independent research, theory, seminar, and the culminating project. The remaining 2 units of electives may be taken in dance or in related areas of interest. The candidate's ability to pursue graduate study will be assessed regularly, and he or she will be advised accordingly.

Financial Aid. Three forms of financial aid are offered by the Department of Dance: resident and nonresident tuition scholarships; graduate teaching assistantships which

include tuition waivers; and the Creative and Performing Arts Fellowship which includes a $4,000 stipend and a tuition waiver. This Graduate College fellowship is awarded to a graduate student who demonstrates outstanding choreographic and performance talent.

ECONOMICS

Chairperson of the Department: PAUL USELDING
Director of Graduate Studies: MARVIN FRANKEL
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R. ARNOULD, W. BAER, F. BLAU, H. BREMS, J. BRUECKNER, P. DUBEY, M. FERBER, M. FRANKEL, J. R. GIERTZ, R. W. GILLESPIE, F. GOTTHEIL, P. HARTMAN, J. HEINS, W. HENDRICKS, D. HODGMAN, G. JUDGE, L. KAHN, A. KHAN, R. KOENKER, J. LEUTHOLD, W. MCMAHON, J. MILLAR, L. MIRMAN, L. NEAL, P. NEWBOLD, S. RASHID, R. RESEK, P. SCHRAN, F. SHUPP, C. SPRENKLE, K. TAIRA, S. TURNOVSKY, P. USELDING, P. WELLS, T. YANCEY
Associate Professors: J. ATACK, D. COES, E. GRINOLS, R. HUSBY, S. STEINKAMP, T. ULEN, H. WILLIAMSON
Assistant Professors: L. ARVAN, A. BERA, L. DEBROCK, H. ESFAHANI, C. KOLSTAD

Graduate Degree Programs. The Department of Economics offers graduate work leading to the Master of Science in Policy Economics and Doctor of Philosophy degrees. The candidate for an advanced degree may specialize in the following fields: economic theory, environment and natural resources, history of economic thought, public finance, monetary theory, international economics, economic history, labor economics, growth and development, comparative economic systems, urban and regional economics, mathematical economics, econometrics, industrial organization, transportation, and human resource economics.

Master's Program in Economics. A master of arts degree and a master of science degree are available for students in the Ph.D. program to enable them to earn a master's as they work towards the Ph.D. degree. Students interested in a terminal master's degree are not admitted to the Ph.D. program.

Master of Science in Policy Economics. This is a specially designed, intensive one-year program of study. It is intended for promising, young administrators in government and private institutions in both Third World countries and advanced, industrial countries who need additional training in the areas of economic analysis and quantitative techniques. Individuals with other backgrounds and interests may substitute appropriate advanced-level courses for the core courses listed below.

The program of study in Policy Economics consists of 10 units of graduate course work. A core of four courses, Macroeconomics, Microeconomics, Statistics, and Applied Econometrics, is required of all students in the program. Beyond that core, students select one field of concentration from those listed above. An additional four graduate credit courses are to be completed. Two of these must be taken in economics and an additional two courses may be in economics or in other areas outside of economics. Students may enter the program in the summer term or in the fall term.

This required course work is further enriched through (1) a short course on computers which is later used in the statistics and econometrics courses; (2) opportunity to go on field trips to observe financial institutions, commodity exchanges, and the like; (3) scheduled lectures by outstanding internationally known economists; (4) discussion groups and tutoring for participants who are having difficulty; (5) program staff to help with visas, housing, and other problems.

Tuition and fees for this program are substantially higher than regular tuition and fees. No financial aid is available for students in this program.

Doctor of Philosophy. In addition to the standard undergraduate preparation in economics, the student is expected to have had at least two semesters of calculus and one of linear algebra to be admitted to the Ph.D. program. The results of the Graduate Record Examination should accompany applications for admission. The Graduate College admission requirements apply. In addition, foreign students must submit TOEFL results.

A total of 24 units of study beyond the bachelor's degree must be completed. Requirements include 1 unit in economic history, 1 unit in history of economic thought, 2 units in statistics and econometrics (some or all can be met by demonstration of proficiency), and 8 doctoral thesis units. The candidate is also required to pass written preliminary examinations in economic theory and in three specialized fields, including at least two in economics (course work with appropriate grades may be substituted for one of the three field exams). The normal preparation for these preliminary examinations is 4 units of study in economics theory and 2 units of study in each of the specialized fields. In addition, the candidate is required to give an oral defense of the thesis proposal and pass an oral final examination covering the research. Students with an appropriate background in economics and mathematics who devote full time to graduate work can complete the Ph.D. degree in three years beyond the bachelor's degree. An additional year or more is usually necessary, however, for those holding part-time assistantships.

Financial Aid. Over the past seven years, the Department of Economics has been able to offer fellowships or half-time assistantships to all domestic students who meet the standards for entrance or continuation in the program. A similar commitment to domestic students is anticipated for the coming year. Almost no foreign students receive financial assistance in the first year of the program.

EDUCATION

(Including Administration, Higher, and Continuing Education; Educational Policy Studies; Educational Psychology; Elementary and Early Childhood Education; Secondary Education; Special Education; and Vocational and Technical Education)

Dean of the College of Education: NANCY S. COLE

Correspondence and Information: P. C. Violas, Associate Dean for Instruction, College of Education, University of Illinois at Urbana-Champaign, 120 Education Building, 1310 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R. E. AMES, R. C. ANDERSON, S. R. ASHER, L. A. BRASKAMP, P. G. BRAUNFELD, A. BROWN, J. R. BURNETT, J. C. CAMPIONE, N. S. COLE, R. J. COLWELL, C. B. COX, R. B. DAVIS, D. DURKIN, J. EASLEY, R. H. ENNIS, E. L. EVERTTS, W. FEINBERG, L. R. GOULET, M. B. GRIGGS, L. W. HARMON, L. W. HEAL, R. A. HENDERSON, J. HILL, K. T. HILL, E. R. HOUSE, S. O. IKENBERRY, W. D. JOHNSON, L. J. JORDAN, B. B. KACHRU, C. J. KARIER, M. B. KARNES, L. G. KATZ, H. KAZANAS, C. LEONHARD, R. L. LINN, J. W. LOEB, H. S. MACLAY, M. L. MAEHR, T. MANOLAKES, G. MCCONKIE, W. W. MCMAHON, A. ORTONY, P. D. PEARSON, A. PESHKIN, L. A. PHELPS, A. C. PURVES, S. P. QUIGLEY, J. D. RATHS, W. W. REDD, F. A. RODGERS, B. V. ROSENSHINE, L. J. RUBIN, S. J. SAVIGNON, M. SAVILLE-TROIKE, P. SHORESMAN, R. A. SMITH, H. T. SPITZE, B. SPODEK, R. L. SPRAGUE, R. E. STAKE, B. E. SWANSON, M. M. TATSUOKA, K. J. TRAVERS, R. TROIKE, P. C. VIOLAS, J. L. WALKER, T. L. WENTLING, C. K. WEST, I. WESTBURY, B. A. YATES, J. S. ZACCARIA

Associate Professors: C. A. AMES, E. F. ANDERSON, J. D. ANDERSON, T. H. ANDERSON, M. ATTWOOD, R. M. BECHER, C. BLANKENSHIP, L. F. BOUTON, F. S. COOMBS, J. R. DENNIS, D. L. ESSEX-SORLIE, H. S. FARMER, J. FARMER, J. A. FLEY, O. E. GOULD, L. IDOL-MAESTAS, H. R. KACZKOWSKI, K. R. KOENKE, J. LEACH, M. V.

LEVINE, A. L. MADSEN, J. MASON, E. F. MCCLURE, J. A. MCCOLLUM, T. L. MCGREAL, J. F. MURPHY, R. E. NELSON, G. B. NORTH, J. C. ORY, S. ROSENHOLTZ, F. RUSCH, E. B. RUSSELL, M. SHORISH, P. SILVER, R. J. SPIRO, K. TATSUOKA, E. R. TERWILLIGER, P. W. THURSTON, R. L. TIERNEY, J. L. WARDROP, C. M. WELLER, K. G. WITZ

Assistant Professors: D. C. BRANDENBURG, E. COPELAND, G. A. CZIKO, J. F. DONALDSON, J. L. ELLICKSON, D. L. HARNISCH, C. E. KOZOLL, S. R. LEVY, L. A. MEYER, K. P. MONTEIRO, E. W. OSBORNE, R. C. PAGE, L. B. PETERAT, A. M. RENZAGLIA, P. S. RIEGEL, M. A. SIEGEL, H. R. SMOCK, E. R. STEINBERG, S. E. TOZER, T. J. TRACEY, W. T. TRENT, R. F. WARD, M. L. WAUGH, R. F. WILSON

Professors Emeriti: C. ALLEN, H. S. BROUDY, T. DENNY, R. N EVANS, J. T. HASTINGS, P. E. HEMP, D. HENRY, G. A. HOKE, L. G. HUMPHREYS, J. M. HUNT, R. S. JONES, H. H. LERCH, C. J. MCINTYRE, W. MCLURE, F. MCMURRAY, L. METCALF, W. J. MOORE, C. H. PATTERSON, M. J. PHILLIPS, L. J. PHIPPS, F. M. RAUBINGER, H. SHORES, R. H. SIMPSON, J. M. SLATER, R. TOMLINSON, L. R. TUCKER

Graduate Degree Programs. The College of Education offers graduate work leading to the Master of Education, the Master of Arts, the Master of Science, the Advanced Certificate, the Doctor of Education, and the Doctor of Philosophy degrees.

Graduate students in the College of Education may enroll in one of the seven departments within the college listed above. The following suggests the broad range of specialties available within the college: agricultural education; aesthetic education; bilingual multicultural education; business, office, and distributive education; comparative education; continuing and adult education; computer applications in education; counseling psychology; early childhood education; educational administration and supervision; educational psychology; elementary school subject specialties (mathematics, language arts, science, social sciences); statistics and measurement; health occupations education; higher education; history of education; educational policy analysis; home economics education; human development; industrial education; language development; learning and instruction; philosophy of education; quantitative and evaluative research methodologies; reading; secondary education (English, mathematics, science, social science); sociocultural perspectives; special education: (a) special learning and behavior problems, severe behavioral handicaps, early childhood education, vocational education for students with special needs, skills improvement, and (b) program administration; and teacher education (elementary, secondary, vocational, special). Other areas of specialization within education may be developed by the student and adviser. More detailed descriptions of specializations offered within departments are available through departmental offices.

Certification. State certification as a teacher or administrator is required for advanced graduate study in some fields. The Council on Teacher Education functions as the all-University governance system for certification. Graduate students who wish to qualify for the council's recommendation for a teaching certificate must complete the appropriate undergraduate or graduate program or its equivalent. Individual exceptions must be sought via petition to the council. Students are invited to contact the coordinator of the Council on Teacher Education to ascertain the approval status of each program with the Illinois State Board of Education.

Master of Education.

Admission. Students may be considered for admission if they are: (1) graduates of an institution awarding a baccalaureate or equivalent degree comparable to that of the University of Illinois at Urbana-Champaign; (2) adequately prepared for advanced study as demonstrated by previous experience, personal qualifications, and scholastic records; and (3) recommended by the proposed department of study. The Graduate College admission requirements apply. Some departments in the College of Education require additional test scores of applicants.

Program Description. Within each of the departments in the College of Education exists a rich variety of practice-centered programs adaptable to the interests of beginning graduate students. The Master of Education is a professional degree

designed for those students who seek a practical understanding for work in the educational professions.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration where there is a 10-unit requirement. Students are required to take two courses in Educational Psychology and two courses in Educational Policy Studies. In Educational Psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In Educational Policy Studies, one ½-unit course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, and 307). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required, and the program is completed by additional 300- or 400-level courses selected by the student in consultation with the academic adviser. Individual departments in the college may require a student to take additional courses beyond these to complete the program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No thesis is required for the Ed.M. degree.

Master of Arts and Master of Science. Admission requirements are the same as those for the Master of Education degree.

Program Description. An extensive offering of research-based programs may be found in the college. All the specialties listed earlier may be pursued from a research perspective. The A.M. and M.S. are research-oriented degrees designed for students who seek research careers in education-related fields.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration where there is a 10-unit requirement. Students are required to take two courses in Educational Psychology and two courses in Educational Policy Studies. In Educational Psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In Educational Policy Studies, one course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, and 307). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required. Individual departments may require a student to take additional courses to complete a program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No more than 2 units of thesis credit count toward the minimum 8 units. Each student must defend the required thesis in an oral examination before a committee of three faculty members chaired by the student's adviser.

Advanced Certificate in Education.

Admission. A master's degree in an appropriate field and two years of successful professional education experience are required for admission to the advanced certificate program. Some advanced certificate programs require students to submit Miller Analogies Test scores for admission.

Program Description. The advanced certificate may be pursued in administration, higher, and continuing education; educational psychology; elementary and early childhood education; secondary education; special education; and vocational and technical education. The advanced certificate program is intended for students who desire a planned course of study beyond the master's degree, but do not wish to pursue the type of scholarly work typically expected in a doctoral program.

Requirements. A minimum of 8 units beyond the master's degree is required for the degree. Four units must be at the 400 level. A student who has not previously taken the foundations courses in Educational Psychology and Educational Policy Studies

required for the Ed.M., A.M., or M.S. degree must do so or pass proficiency examinations for these courses. The credit–no credit option may not be used to satisfy the minimum requirements for this degree.

Doctor of Education.

Admission. Applicants for study leading to doctoral degrees must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Departments should be contacted concerning their requirements for submission of test scores and other information. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The general admission requirements of the Graduate College must be met.

Program Description. Students may study any of the broad range of specialties listed on page 103. Programs leading to the Doctor of Education degree are designed to provide advanced professional training and to develop further ability in the scholarly study of professional practice-centered problems.

Requirements. Sixteen units of course work beyond the master's degree are required. A student who has completed course work taken as part of the requirements for the Advanced Certificate in Education at the University of Illinois at Urbana-Champaign may petition for the application of not more than 6 units of such work toward the program leading to the Doctor of Education, provided that the course work has been taken within five years of the date of petition. Within the required 16 units, students must complete two perspective course options of 2 units each, designed to help them understand and interpret their developing practitioner-scholar role. Options are chosen from an approved list of courses in several areas. Between admission and completion of degree requirements, an Ed.D. student must complete a supervised field work experience for which from 1 to 4 units credit may be awarded.

Minimum residence requirements may be met by on-campus registration for either two consecutive semesters with at least 3 units of course work in each, or one semester with at least 3 units, plus at least 1½ units in the summer session immediately preceding or following.

Near the end of course work and before admission to the preliminary oral, the applicant must take a minimum of ten hours of written examinations, eight in the special field of study and two in research methodology. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by three readers. All parts of the examination must display competent doctoral work to all readers.

In addition to the 16 units of course work, an Ed.D. candidate must complete a thesis in accordance with the general requirements of the Graduate College.

Doctor of Philosophy.

Admission. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The Graduate College admissions requirements apply. Applicants must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Departments should be contacted concerning their requirements for submission of test scores and other information.

Program Description. Students may study any of the specialties listed on page 103. The Ph.D. program is planned by each student with an adviser to develop the student's ability to do scholarly research in a specialized field of education.

Requirements. Sixteen units of credit beyond the master's degree, including up to 8 units of thesis credit, are required for the Ph.D. degree. A candidate who has not

written a master's thesis is required to prepare, submit, and defend an equivalent paper. Each Ph.D. candidate in the College of Education completes, as a part of the graduate program, an approved supervised professional work experience that consists of at least the equivalent of half-time work for one semester. This requirement is to be completed during the period between admission and completion of degree requirements. Acceptance of credit earned elsewhere does not reduce the resident credit requirement. A residence period, beyond the master's, must include two successive semesters on the Urbana-Champaign campus, in each of which the student takes a minimum of 3 units.

A student is required to demonstrate competence in one of several research methodology areas. This requirement is in addition to the minimum of 16 units of credit beyond the master's degree. Research methodology area requirements are available from the Graduate Programs Office, College of Education.

A Ph.D. candidate must complete a minimum of eight hours of written examinations in an area of specialization. Examinations are taken in two parts of four hours each. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by at least three readers. All parts of the examination must display competent doctoral work to all readers.

A Ph.D. candidate must complete a thesis in accordance with the general requirements of the Graduate College.

Financial Aid. All major doctoral programs have teaching and research assistantships available. Some fellowships and tuition and service fee waivers are also available. In the past it has been possible for a majority of doctoral students to receive some form of financial aid during their period of study. Additional information concerning financial aid can be obtained from the seven departmental offices listed on page 102.

ELECTRICAL AND COMPUTER ENGINEERING

Head of the Department: T. N. Trick

Correspondence and Information: Graduate Programs, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 155 Electrical Engineering Building, 1406 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. A. Abraham, R. Adler, G. E. Anner, R. B. Ash, M. T. Basar, D. L. Bitzer, S. A. Bowhill, R. M. Brown, C. A. Cain, J. C. Chato, A. Cho, J. J. Coleman, P. D. Coleman, J. M. Crowley, J. B. Cruz, Jr., E. S. Davidson, G. Deschamps, T. A. DeTemple, F. Dunn, J. D. Dyson, J. G. Eden, W. L. Emery, E. W. Ernst, O. L. Gaddy, C. S. Gardner, P. Handler, D. F. Hang, M. S. Helm, K. Hess, N. Holonyak, Jr., T. S. Huang, B. J. Hunsinger, W. K. Jenkins, E. C. Jordan, P. Kokotovic, B. C. Kuo, S. W. Lee, C. H. Liu, Y. T. Lo, P. E. Mast, W. Mayeda, P. E. Mayes, G. A. Metze, G. H. Miley, R. Mittra, D. E. Muller, S. Muroga, M. A. Pai, W. R. Perkins, D. Pines, H. V. Poor, W. J. Poppelbaum, F. Preparata, M. B. Pursley, N. Rao, S. R. Ray, J. E. Robertson, C. T. Sah, D. V. Sarwate, C. F. Sechrist, Jr., L. G. Smith, G. E. Stillman, G. W. Swenson, Jr., T. N. Trick, R. J. Turnbull, M. E. Van Valkenburg, J. T. Verdeyen, D. L. Waltz, N. Wax, K. C. Yeh

Associate Professors: A. Ahuja, J. W. Beauchamp, D. J. Brown, W. C. Chew, M. Faiman, L. A. Frizzell, B. E. Hajek, I. N. Hajj, K. Kim, P. W. Klock, W. J. Kubitz, P. R. Kumar, R. L. Magin, E. A. Mechtly, H. Merkelo, L. D. Metz, H. Morkoc, D. C. Munson, Jr., W. D. O'Brien, Jr., J. H. Patel, P. L. Random, P. W. Sauer, P. D. Schomer, H. G. Slottow, J. R. Tucker, B. W. Wah, L. Wozniak

Assistant Professors: K. S. Arun, P. Bannerjee, A. R. Barron, S. L. Chuang, G. DeJong, K. D. Forbus, S. J. Franke, W. K. Fuchs, J. W. Grizzle, M. Ilic-Spong, R. Iyer, E. Kudeki, J. P. Leburton, H. Lee, M. C. Loui, J. W. Lyding, B.

Oakley, K. R. Poolla, V. Ramachandran, V. B. Rao, M. W. Spong, R. E. Stepp III, L. Weber, B. C. Wheeler

Graduate Degree Programs. Graduate study in electrical and computer engineering leading to the degrees of Master of Science and Doctor of Philosophy is offered in four general areas: circuits and systems, which include integrated circuits, computer-aided design, signal and image processing, control systems, and optimization; computers and information systems, which include computers, switching theory, information theory, communication theory, information retrieval, computer vision, robotics and artificial intelligence; electromagnetic fields, which include antennas, propagation, aeronomy, radio location, and holography; and physical and quantum electronics, which include solid state theory and devices, compound semiconductor epitaxial growth techniques, microwave and high-speed devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, biomedical instrumentation, ultrasonics, and electronic music.

Admission. To be eligible for admission, a prospective student must have completed, with a grade-point average of 4.0 or better (A = 5.0), an electrical engineering curriculum substantially equivalent to that of the University of Illinois at Urbana-Champaign. Graduates of curricula in the physical sciences and mathematics may also be admitted to advanced study if they have the necessary background to profit from graduate work in electrical engineering.

Master of Science. A minimum of 8 units, including a maximum of 2 units of thesis research, must be completed for the master's degree. At least 4 units must be 400-level courses in electrical and computer engineering (up to 2 thesis units may be counted), including one from a list of specific courses in each of two of the four basic areas. Courses which are required in the undergraduate curriculum at the University of Illinois at Urbana-Champaign cannot be applied to the credit requirements for an advanced degree. No final examination is required for the M.S. degree.

Doctor of Philosophy. All students desiring to enter the doctoral program must take the electrical and computer engineering qualifying examination during the term they earn their seventh unit of graduate credit, excluding Electrical Engineering 499 (Thesis Research) and Electrical Engineering 490 (Seminar in Special Topics). Students who enter with the master's degree take the examination during the first term here. Admission to the doctoral program is based upon the quality of the course work, the qualifying examination, and an assessment of the ability of the candidate to do independent research work.

Eight units of course credit beyond the master's degree or the equivalent, successful completion of the preliminary examination, 8 units of thesis research, a satisfactory thesis, and satisfactory defense of the thesis in a final examination are minimum requirements for the degree of Doctor of Philosophy. No foreign language proficiency is required.

Extramural Study. The department offers extramural graduate courses administered by the Office of Continuing Education and Public Service leading to the Certificate in Engineering granted by the office. Requirements for the M.S. degree can be fulfilled by one semester of residence after completing the requirements of the certificate program. For information about this certificate program, write to the Office of Continuing Education and Public Service, University of Illinois at Urbana-Champaign, 112 Illini Hall, 725 South Wright Street, Champaign, Illinois 61820.

Under special circumstances, it may be possible to complete the M.S. degree off campus by taking extramural graduate courses that are designated for residence credit, including the M.S. thesis requirement. Such cases are considered on an individual basis upon petition to the departmental graduate committee.

ENGLISH

Head of the Department: MARGARET DICKIE
Director of Graduate Studies: JACK STILLINGER
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 210 English Building, 608 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. BARON, N. BAYM, E. BRANDABUR, H. COLE, D. CURLEY, M. DICKIE, J. FRAYNE, J. FRIEDMAN, P. GARRETT, G. HENDRICK, J. HURT, D. KRAMER, L. LIEBERMAN, C. NELSON, C. RAWSON, C. SANDERS, R. SHUMAN, A. STEIN, J. STILLINGER, E. WATTS
Associate Professors: G. ADELMAN, R. CARRINGER, L. DANIELSON, J. DUNDAS, J. DUSSINGER, C. FONTENOT, P. FRIEDMAN, A. GUIBBORY, F. HODGINS, A. KAUFMAN, M. KAUFMANN, D. KAY, J. KLEIN, C. KYLE, D. MAJDIAK, H. MARDER, B. MICHELSON, M. MULLIN, R. SCHNEIDER, M. SHAPIRO, B. SMALLEY, J. STUBBS, Z. SULLIVAN, L. WALDOFF, R. WHEELER
Assistant Professor: L. CHAI, A. DECK, J. HINELY, R. PARKER, J. STOTTLAR

Graduate Degree Programs. The Department of English offers programs of study leading to the Master of Arts, the Master of Arts in the Teaching of English, and the Doctor of Philosophy degrees. The Ph.D. program is, in general, designed to educate and train teacher-scholars who will take positions in colleges and universities throughout the country. The Master of Arts programs may be either a first step toward the Ph.D. degree or a final educational stage for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. There is no graduate creative writing program.

Admission. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least 20 semester hours of undergraduate college work in English and American Literature excluding required college work in rhetoric or composition. Applicants are required to submit Graduate Record Examination scores for the verbal and advanced tests. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been significantly higher than the 4.0 (A = 5.0) required by the Graduate College. The committee on admissions tends to select those applicants showing a solid array of undergraduate courses, knowledge of a foreign language, and real promise of earning degrees within a reasonable time. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Arts. A candidate for the A.M. in English must spend at least two semesters or the equivalent in residence and complete at least 8 units of course work. At least 4 units must be at the 400 level, and 3 of the 4 must be in English. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work. The student must pass one formal examination, the master's comprehensive examination. A full-time student can complete this program in an academic year.

Master of Arts in the Teaching of English. A candidate for the M.A.T.E. degree must spend at least two semesters or the equivalent in residence. Certified teachers may qualify for the degree by completing an approved program consisting of 4 units of English, 1 unit of English methods, 2 additional units in education, and one elective, usually in English. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work. Candidates entering the program without a teaching certificate must complete courses which are specified for certification, including a supervised teaching internship, as well as meeting the other requirements of the degree. There is one formal examination, a comprehensive examination based on the course program.

Doctor of Philosophy. A student wishing to continue beyond the master's degree

must apply formally and is considered in competition with applicants who are taking the master's degree elsewhere. Seldom are applicants accepted with graduate averages below 4.5. Students who have taken their Master of Arts degrees elsewhere must pass the master's comprehensive examination during their first year of residence and give evidence of knowledge of one foreign language on a level equivalent to that required of A.M. candidates in our program. (The master's comprehensive examination can be waived by the director of graduate studies if the candidate submits appropriate evidence that a similar examination formed part of his or her master's degree.) The student takes 8 units of course work, planned in consultation with an adviser. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There is one formal examination, the special field examination, which is normally taken as the student completes course work and prepares to write the thesis. The student then goes on to write a thesis under the direction of a committee composed of three professors. A total of 16 units beyond the master's degree, including thesis credits, are required. A full-time student can complete this program in three years beyond the master's degree.

Financial Aid. Financial aid is available to students in the form of fellowships, teaching assistantships, and waivers of tuition and service fees. Applicants are considered at only one time of the year, and the deadline for submitting applications is February 15. For complete information about the program, prospective applicants should write to the above address for the department's handbook on graduate studies in English.

ENGLISH AS A SECOND LANGUAGE

Director of the Division: BRAJ B. KACHRU

Correspondence and Information: Director, Division of English as a Second Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: K. ASTON, C. C. CHENG, B. KACHRU, Y. KACHRU, H. MACLAY, S. SAVIGNON, M. SAVILLE-TROIKE, R. TROIKE, L. ZGUSTA

Associate Professors: L. BACHMAN, E. BOKAMBA, L. BOUTON, J. R. COWAN, W. DICKERSON

Assistant Professors: G. CZIKO, M. MACK

Graduate Degree Program. The Division of English as a Second Language offers a Master of Arts in the Teaching of English as a Second Language (M.A.T.E.S.L.).

Admission. In addition to meeting the Graduate College admission requirements, applicants should present evidence of appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher-training curriculum in one of the above or in elementary education. Native speakers of English must have studied at least one foreign language for four semesters or the equivalent or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English by attaining a score of at least 570 on the TOEFL examination. The TOEFL examination is required of all applicants to the M.A.T.E.S.L. curriculum who are not native speakers of English, even when the requirement for that examination has been waived by the University itself.

Master of Arts in the Teaching of English as a Second Language. The program leading to this degree requires a minimum of 10 units, 2 of which must be taken from 400-level courses. Candidates must either pass a written comprehensive examination or complete a thesis. Normally, the M.A.T.E.S.L. degree can be completed in four semesters. The curriculum is interdisciplinary and involves work in such areas as descriptive linguistics, language acquisition, the interrelationship of language and

culture, language pedagogy, language testing, teaching English as a second language and bilingual education, and language study. Through the scope and diversity of its courses, the master's program prepares students for both overseas and domestic opportunities.

The Doctor of Philosophy degree, an option in applied linguistics and the teaching of English as a second or foreign language, is available through the Department of Linguistics and the interdisciplinary program in Second Language Acquisition and Teacher Education (SLATE). Members of the graduate faculty of the Division of English as a Second Language are available to serve on doctoral committees. Faculty specializations include neurolinguistics, sociolinguistics, psycholinguistics, language testing, contrastive discourse, lexicography of English, stylistics, language processing, reading, literacy, pragmatics, computers in second language acquisition and learning, methodology of language teaching, and English in the world context. Applicants interested in working toward a doctorate in linguistics should write to the Chairman, Department of Linguistics, 4088 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801. Those interested in SLATE should write to the Chair, SLATE Program, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801.

Financial Aid. Financial assistance is not normally awarded during a M.A.T.E.S.L. candidate's first semester. Exceptions to this policy are sometimes made when an applicant has had extensive experience in teaching English as a second language or has an outstanding academic record. A limited number of University fellowships are available for exceptionally qualified candidates. Teaching assistantships are normally available to qualified students in the division and in the Intensive English Program which is a constituent unit of the division.

ENVIRONMENTAL STUDIES

Director of the Institute: ROGER A. MINNEAR

Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 408 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E. D. BRILL, JR., R. J. BURDGE, D. M. GARDNER, L. G. HANSEN, P. K. HOPKE, L. D. HOPKINS, R. L. METCALF, R. A. MINEAR, G. L. ROLFE, W. D. SEITZ

Associate Professors: R. A. LARSON, M. J. PLEWA

Assistant Professors: R. W. CARLSON, B. M. FRANCIS, E. H. JEFFERY, G. V. JOHNSON, C. D. KOLSTAD, J. VINING

Professor Emeritus: B. B. EWING

The Institute for Environmental Studies coordinates and supports programs of research, teaching, and public service in areas related to environmental quality. Although the institute does not offer degree programs, it offers graduate-level courses on environmental subjects and provides opportunities for students working within specific disciplines to participate in interdisciplinary environmental research.

The institute's close ties with many other campus units make it possible for students seeking graduate degrees from those units to engage in environmental research within the institute's varied interdisciplinary program. Current scholarly research at the institute addresses a wide range of significant environmental problem areas, including environmental toxicology, environmental mutagens and carcinogens, water quality and water resources management, air pollution and source contribution resolution, effects of pollution on biological systems, environmental chemistry, social and economic impacts of resource development, risk assessments, analysis of environmental decision making and alternative pollution control methods, and environ-

mental quality management. This research program involves faculty with backgrounds in such diverse fields as genetics, chemistry, physics, pharmacology, teratology, ecology, engineering, economics, leisure studies, sociology, and law.

The interdisciplinary environmental toxicology program, coordinated by the institute, offers specialized training in the study of toxic substances in the environment. This program has recently been expanded to provide a concentration in the health effects of environmental toxicology. Graduate students with backgrounds in fields such as the life sciences, health sciences, chemistry, or engineering, are eligible to apply for admission to the program. Faculty from several University schools and colleges participate in the program's teaching and research activities and serve as research advisers to its students. In addition to completing a core of course work in environmental toxicology, degree candidates must satisfy the requirements of the cooperating graduate unit in which they are enrolled. Financial support is available through a limited number of graduate research assistantships for which students may apply through the institute. A brochure describing the program and the requirements for admission and graduation is available from the institute.

The institute's interdisciplinary program in environmental mutagens and carcinogens complements the graduate degree specialization in environmental toxicology described above. The objectives of this program are to develop methods to detect and identify mutagenic substances; determine their sources, transport, transformations, and fate in the environment; evaluate exposures to target organisms; and evaluate the economic and social impacts of these exposures.

Further information on opportunities for graduate education in environmental studies at the University of Illinois at Urbana-Champaign is provided in *Environmental Graduate Programs,* a brochure available from the institute. Also available is a comprehensive listing of environmentally oriented courses currently offered by the institute and by other campus units.

EXTENSION EDUCATION

Head and Graduate Adviser: VIOLET M. MALONE

Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 330 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

Graduate Degree Program. The Master of Extension Education degree program is a professional program providing advanced study in agriculture and in human resources and family studies, including further study in the social sciences.

Admission. Applicants are expected to possess a bachelor's degree in agriculture, home economics, or a closely related field, and to meet the Graduate College admission requirements.

Degree Requirements. The program consists of a minimum of 8 units with a thesis or 9 units without a thesis. Three units must be in 400-level courses, with 2 of these in the major field. A major, consisting of 4 units, may be taken in agriculture, human resources and family studies, or the social sciences. Students majoring in agriculture or human resources and family studies select 4 additional units from the social sciences; those majoring in the social sciences select 4 additional units from agriculture or human resources and family studies. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. At least 4 units must be earned in residence on the Urbana-Champaign campus.

FINANCE

Chairperson of the Department: WILLIAM R. BRYAN

Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: W. R. Bryan, T. E. Cammack, P. F. Colwell, N. A. Doherty, J. A. Follain, J. A. Gentry, R. A. Haugen, C. F. Lee, C. M. Linke
Associate Professors: J. E. Finnerty, M. J. Lynge, Jr., R. S. Sears, J. K. Zumwalt
Assistant Professors: R. E. Cannaday, K. C. Chen, S. P. D'Arcy, Y. Dokko, H. Y. Park, L. O. Scott, D. T. Whitford

Graduate Degree Programs. The Department of Finance offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The following fields are available for specialization: financial institutions, corporation finance, investment, insurance, and urban economics and real estate.

Admission. The minimum required admission grade-point average is 4.0 (A = 5.0). To be admitted without deficiencies, the applicant should have completed an undergraduate course in computer science, financial accounting, managerial accounting, principles of economics, calculus (two semesters), probability and statistics (two semesters), and two courses in financial management. Courses to remove deficiencies may be taken after beginning the program, but such courses will not count towards the departmental requirements for graduation. Candidates are required to submit aptitude test scores from the Graduate Management Admission Test. The score will be used by the Graduate Standards Committee, along with other information, in evaluating the applicant's qualifications for graduate study.

Master of Science. A candidate for the master's degree in finance must spend at least two semesters in residence. The credit requirement for this degree is 8 or 10 units. Two units of economic theory are normally required. However, students with sufficient economic theory course work may have this requirement replaced by other economics course work, additional finance course work, or additional elective course work, as determined by the Graduate Standards Committee. The department has an optional thesis policy for the master's degree. The credit requirement for this option is 8 units. Three of the 8 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work. The credit requirement for the nonthesis option is 10 units. Three of these 10 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work.

Master of Science in Finance and Master of Architecture. The Department of Finance and School of Architecture offer a joint masters program. Individual requirements are the same for each individual program initially. Program prerequisites are a baccalaureate degree in architecture, including Computer Science 102 and Mathematics 120 to 131; background courses in finance met by graduate course requirements; 2 units of economic theory; 3 units of quantitative methods; 4 units in finance; 4¾ units of architectural options courses; 3 units of the financial management sequence in business management; and other elective requirements. The joint masters program is granted when these requirements, totalling 21¾ units, are completed.

Doctor of Philosophy. The first stage toward the degree of Doctor of Philosophy ends when the candidate receives a master's degree or earns the equivalent credit; the second stage comprises 8 units of work, fulfillment of departmental requirements, and successful preliminary examinations; the third stage includes research and seminars (8 units), preparation of the dissertation, and the final examination. A student's courses and research are planned with his or her adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the department. The student should become familiar with these requirements and satisfy them as soon as possible.

A candidate for the doctorate who has received a master's degree from a recognized institution receives the equivalent of 8 units of credit for that work. If such credit is to be used in partial fulfillment of the requirements for the doctorate, the candidate is examined on the content of the courses involved at the time of the preliminary examinations.

To enter the third stage of a doctoral program, a candidate must pass preliminary

examinations to test his or her qualifications for further advanced study and research. The examinations are written and oral. Candidates are responsible for four fields for preliminary examination: economic theory, two finance areas, and one elective area.

The Doctor of Philosophy is primarily a research degree, and the candidate must demonstrate the capacity for independent research by producing an original thesis on a topic within his or her major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The candidate is admitted to the final examination by the dean of the Graduate College upon completion of the dissertation and the recommendation of the department.

FOOD SCIENCE

Head of the Department: ARTHUR J. SIEDLER

Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 567 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. CHERYAN, J. W. ERDMAN, P. V. JOHNSTON, J. MILNER, R. NELSON, T. NISHIDA, E. G. PERKINS, A. J. SIEDLER, M. P. STEINBERG, W. J. VISEK, L. S. WEI, L. D. WITTER

Associate Professors: C. ARGOUDELIS, P. BECHTEL, B. H. CHO, S. E. MARTIN

Assistant Professors: W. ARTZ, I. BAIANU, H. P. BLASCHEK, R. SPECKMAN, R. VILLOTA

Graduate Degree Programs. The Department of Food Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: processing-engineering, chemistry, microbiology, and nutrition.

Admission. In addition to meeting the Graduate College admission requirements, a student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies may be removed with graduate credit courses designed for this purpose.

Master of Science. To obtain a master's degree, a student must have 2¾ units in food science. The remainder of the 8 units of credit required consists of graduate courses selected from inside or outside the department that are appropriate for the training and development of the student in the field of specialization. At least 3 units must be at the 400 level (¼ unit of this is seminar). A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required. Students whose native language is not English are required to have competence in English by passing English as a Second Language 111.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the Doctor of Philosophy degree must have additional credit in seminar (¼ unit) and thesis research (8 units). The remainder of the 16 units required for the degree consists of graduate courses selected from inside or outside the department that are appropriate for training in the student's field of specialization. The student must demonstrate proficiency in one foreign language or complete a special option approved by the department, which is not counted as part of the 16 required units of credit. Students whose native language is not English must pass English as a Second Language 401. Upon completion of all necessary formal courses and special options, the student is required to take an oral preliminary examination. After passage of the preliminary examination, the student's activities are primarily devoted to thesis research. Upon submission of the thesis, the candidate is admitted to the final oral

examination before a graduate faculty committee. The Ph.D. degree in food science may be combined with the study of medicine in the University of Illinois at Urbana-Champaign Medical Scholars Program.

FORESTRY

Head of the Department: G. L. Rolfe

Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 110 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. Chow, G. L. Rolfe

Associate Professors: J. O. Dawson, G. Z. Gertner, J. J. Jokela, R. M. Skirvin

Assistant Professors: S. Brown, G. E. Campbell, R. W. Carlson, J. M. Cheeseman, M. B. David, G. A. Mendoza

Graduate Degree Program. The Department of Forestry offers graduate work leading to the Master of Science degree. The Doctor of Philosophy degree is not offered by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department or is on the staff of an interdisciplinary doctoral program. Such areas of study include ecology, economics, genetics, plant physiology, soils, and wood science.

Admission. The prerequisite for graduate study in the Department of Forestry is a bachelor's degree in forestry or a related field. A grade-point average of 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Those applicants who meet the minimum requirement are encouraged to take the Graduate Record Examination, as exceptions to these prerequisites are permitted on an individual basis. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. To qualify for the Master of Science degree, a student must earn at least 8 units of graduate credit, with at least 3 units in courses at the 400 level. At least half of the 8 units must be from courses meeting on the Urbana-Champaign campus or from courses approved by the Graduate College for residence credit, although meeting at other locations. Depending on their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student in such areas as biometrics, ecology, economics, genetics, management, physiology, soils, statistics, and wood science.

In most cases a thesis is required, but it may be waived if such waiver will result in a more appropriate program for the individual student. The forestry seminar is required of all graduate students. There are no language or qualifying examination requirements.

Financial Aid. Besides University and other fellowships for which graduate students may compete, the Department of Forestry offers the Spaeth-Boggess Fellowship and a number of graduate research assistantships ranging from 25- to 67-percent time. Assistants are exempt from tuition and the service fee but not from the health service and insurance fees.

Research Interests. Major areas of faculty research include water quality and watershed management, nutrient cycling, ecology of forested bottomlands, tropical forest ecology, management of forest vegetation in stressed urban settings, utilization of eastern hardwood species and plant residues, forest tree improvement through selection and breeding, properties of wood-base materials, forest/soil relationships, dynamics of forest soils, symbiotic nitrogen fixation by trees and shrubs, modeling of forest growth, and economics and management of Illinois forests.

FRENCH

Head of the Department: PAUL GAENG
Director of Graduate Studies: EMILE TALBOT
Correspondence and Information: Department of French, 2090 Foreign Languages Building, University of Illinois at Urbana-Champa gn, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: B. C. BOWEN, H. DE LEY, P. GAENG, F. JOST, F. MARTY, R. J. NELSON, S. SAVIGNON
Associate Professors: E. ACCAD, S. GRAY, F. JENKINS, A. K. MORTIMER, A. OMAGGIO, L. B. PRICE, E. TALBOT
Assistant Professors: J. JOSEPH, D. KIBBEE, S. SHINALL

Graduate Degree Programs. The Department of French offers graduate courses leading to the Master of Arts, the Master of Arts in the Teaching (M.A.T.) of French, and the Doctor of Philosophy. Candidates for the A.M. degree may specialize in literature, in expanded French studies, or in French linguistics. Candidates for the Ph.D. degree may choose one of four specializations: literature, expanded French studies, French linguistics, or second-language learning and teaching.

Admission. Students are normally considered for admission to the A.M. program who have an overall undergraduate admission average of 4.0 (A = 5.0) with an average in French of 4.5. Students should normally have had a college major in French. Entering students are given a diagnostic test to determine whether remedial study in French language courses is necessary. Some knowledge of other Romance languages and literatures is desirable. Students seeking admission to the Ph.D. program with a Master of Arts degree earned elsewhere are expected to have a 4.5 grade-point average in graduate courses. Their master's degree should be in French literature or in French studies. Candidates seeking admission to the Ph.D. concentration in second-language learning and teaching may hold an M.A.T. degree.

Master of Arts. Candidates in all master's programs must complete 8 units of course work and pass an A.M. examination. Candidates in literature must take an A.M. examination based on a reading list covering the field of French literature. The examination in expanded French studies covers, in addition to readings in the field of French literature, material bearing on the candidate's field of specialization in French culture or related disciplines. The examination in linguistics is based on a list of readings in linguistics and in literature. Candidates in all programs are required to demonstrate, at the time of the master's examination, an ability to communicate effectively in both written and oral French.

Master of Arts in the Teaching of French. An applicant for admission is normally expected to have a bachelor's degree in French teacher education or equivalent teaching experience. Candidates for this degree must complete a total of 8 units as follows: 4 units in French civilization, language, literature, and/or cinema (excluding French 313, 314), at least 2 of which must be at the 400 level; 2 units in second language learning and teaching chosen from current Department of French offerings, e.g., French 360, 382, 463, 481, 443 (when topic is appropriate); 2 units of electives in an appropriate related area or areas chosen with the approval of the M.A.T. adviser. Remedial work in French diction and syntax may also be required of candidates who show deficiencies in these areas. In addition to completion of course work, candidates will be required to pass a comprehensive written and oral examination during their last semester of study, demonstrating a satisfactory level of communicative competence in French and the ability to integrate effectively their knowledge of French language, literature, and culture in developing a philosophy and practice of teaching.

Candidates who are not certified for Illinois public secondary school teaching may meet certification requirements by completing the undergraduate program in

the teaching of French or its equivalent in addition to the requirements for the M.A.T. program described above.

Doctor of Philosophy. Candidates in all programs must complete 16 units beyond the master's degree, including a minimum of 8 units of course work beyond the A.M. degree, and must pass a preliminary examination and write an acceptable thesis. Although teaching is not a general Graduate College requirement, the Department of French requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Ph.D. in Literature. This program is designed to prepare literary scholars and teachers. Candidates are required to include courses in research methods and textual criticism, linguistics, old French, and French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

Ph.D. in Expanded French Studies. The doctoral program in expanded French studies allows for research in francophone literature or in the relation of French literature to some nonliterary discipline. Two of the required 8 units of course work beyond the A.M. degree may be taken in other departments or programs when available and approved by the graduate adviser. Candidates are required to include courses in French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

Ph.D. in French Linguistics. This is a graduate curriculum that offers training in French historical and descriptive linguistics and philology. Students in this program are required to take 3 units in French literature and may elect up to 2 units of related work in other departments, in addition to a required course in the structure of French and either the history of French or a course in Old French. At the doctoral level, a concentration in Romance linguistics is available in cooperation with the Department of Spanish, Italian, and Portuguese; the Department of Linguistics; and the Department of the Classics.

Ph.D. in Second-Language Learning/Teaching. An interdisciplinary concentration in second-language learning/teaching is available to candidates with an A.M. or M.A.T. degree in French and at least one year of experience in teaching French as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology, in addition to advanced study in French language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Financial Aid. Assistantships and University Fellowships are awarded. Several graduate students each year spend the school year in France under a graduate exchange agreement with the French government. The department has also initiated exchange programs with the University of Metz, France, and the University of Liege, Belgium.

GENERAL ENGINEERING

Head of the Department: J. S. DOBROVOLNY

Correspondence and Information: T. F. Conry, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, 104 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: T. F. CONRY, J. S. DOBROVOLNY, E. N. KUZNETSOV, J. V. MEDANIC

Associate Professors: O. COSKUNOGLU, W. J. DAVIS, L. D. METZ, M. H. PLECK, T. R. WOODLEY, L. WOZNIAK

Assistant Professors: S. A. BURNS, J. V. CARNAHAN, W. B. HALL, M. H. MOEINZADEH, H. L. M. REIS, M. W. SPONG

Graduate Degree Program. The Department of General Engineering offers graduate

study leading to the degree of Master of Science. The program consists of a core of required courses including a design thesis or project, coordination of engineering design projects, and legal problems in engineering design. In addition, the student undertakes study in a disciplinary area outside the department.

The master's degree program in general engineering is intended for students interested in engineering project planning and execution, stressing the design function for manufacturing. The program thus offers an approach to engineering that crosses disciplinary lines. Graduates of the program are prepared to enter professional engineering positions in industry, government, and private practice. The program is designed to accommodate the student who considers the M.S. as the terminal degree.

Admission. Applicants who have completed degree requirements in an accredited engineering program or its equivalent are eligible to apply for admission. Qualifications for admission include a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work.

Master of Science. The minimum requirement for the degree is 8 units of credit with a thesis or 9 units without a thesis. Each candidate must successfully complete a minimum of 2 units of project design for the nonthesis degree or one unit of thesis research for the thesis degree. Each candidate must also successfully complete at least 7 additional units of graduate course work, of which at least 3 units must be at the 400 level.

Financial Aid. Qualified students may apply for financial aid in the form of teaching and research assistantships and waivers of tuition and service fees.

Research Interests. The research interests of the faculty include reliability, design optimization, biomechanics, robotics, systems dynamics and simulation, human factors in design, operations research/management science, computer graphics in design and applied mechanics.

GEOGRAPHY

Head of the Department: G. J. D. Hewings

Correspondence and Information: Director of Graduate Admissions, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, 607 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. S. Alexander, J. D. Fellmann, A. Getis, B. M. Hannon, G. J. D. Hewings, J. A. Jakle, C. C. Roseman, D. B. Shimkin, J. Thompson

Associate Professors: J. O. Huff, D. L. Johnson, J. V. O'Loughlin, C. E. Thorn

Assistant Professors: T. D. Bassett, T. D. Frank, S. A. Isard

Graduate Degree Programs. The Department of Geography offers work leading to the Master of Arts, Master of Science, Master of Science in the Teaching of Geography, and Doctor of Philosophy degrees. The department's specializations are organized into five programs: (1) economic geography and regional science (industrial location, transportation, techniques of urban and regional analysis, and urban systems); (2) historical geography (historic landscapes, historic preservation, urban morphology, and cultural landscape evolution); (3) geomorphology (coastal, periglacial, soil, and Quaternary studies); (4) social geography (migration, voting behavior, diffusion, and urban analysis); and (5) spatial data management and analysis (quantitative skills, cartography, computer cartography, and remote sensing). Detailed descriptions of these programs may be obtained from the department office. A program for prospective teachers, the Master of Science in the Teaching of Geography, is also available.

Admission. Students applying for admission to the master's programs are expected to have a strong undergraduate background in geography and/or related disciplines. In addition to other Graduate College admission requirements, a grade-point average

of at least 4.0 (A = 5.0) in the undergraduate major is required. Ph.D. candidates are generally expected to have at least a 4.5 average in previous graduate work.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the Master of Science; others receive the Master of Arts. The Graduate College requirements for the master's degree apply.

Master of Science in the Teaching of Geography. Candidates for this degree must earn 4 units in geography, 2 of which are geography electives, 2 units in education, and 2 units in electives.

Doctor of Philosophy. Admission presupposes distinction in completing the master's program in geography or its equivalent at the University of Illinois at Urbana-Champaign. In the doctoral program, the student develops depth in the program chosen for specialization and further advances in research competence. Of the 16 units required beyond the master's degree, 4 units of study in allied disciplines and a minimum of 6 additional units in geography are required. A student must complete the course requirements as determined by an individually planned program, initiate and complete research projects, and qualify for candidacy by passing the preliminary examination. Although there is no departmental foreign language requirement, students may offer a foreign language as a research technique.

Financial Aid. Fellowships and teaching and research assistantships are available in the department. See the section on financial aid for a description of the provisions of these awards.

Departmental Facilities. The department houses several laboratories: the Spatial Data Analysis Laboratory provides a research and training facility for the analysis and display of spatial patterns derived from maps, aerial photos, and satellite images. Other laboratories include cartography, remote sensing, photographic geomorphology, and soils; in addition, interactive computer terminals, an X-ray diffractometer, and a vacuum spectrometer are also available.

Map and Geography Library. Contained within the University's outstanding library is the Map and Geography Library which has an excellent collection of geography monographs, periodicals, and nearly 300,000 maps and aerial photographs.

GEOLOGY

(Including Earth Science)

Head of the Department: David E. Anderson

Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois at Urbana-Champaign, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. E. Anderson, T. F. Anderson, D. B. Blake, A. V. Carozzi, R. L. Hay, D. M. Henderson, R. J. Kirkpatrick, G. deV. Klein, R. L. Langenheim, C. J. Mann, P. A. Sandberg

Associate Professors: A. T. Hsui, W. H. Johnson, A. S. Nieto

Assistant Professors: J. D. Bass, C.-Y. Chen, W.-P. Chen, S. Marshak

Graduate Degree Programs. The Department of Geology offers programs leading to the Master of Science and Doctor of Philosophy in Geology and the Master of Science in the Teaching of Earth Science. Programs in carbonate geology; clay mineralogy; engineering geology and rock mechanics; geochemistry; geophysics; geomorphology and Quaternary geology; hydrogeology; marine geology; mathematical geology; mineralogy; igneous, metamorphic, and experimental petrology; paleontology; stratigraphy; sedimentology and sedimentary petrography; structural geology; and transport processes give students a wide choice of courses and areas of specialization.

Admission. The admission requirements of the Graduate College apply. In addition, the aptitude test and one advanced test (generally geology) of the Graduate Record Examination are required for admission to graduate work in geology. Geology majors having at least a year each of biology, calculus (preferably three semesters), chemistry, and physics are given preference, but students from cognate fields are encouraged to apply. For more information, write the Educational Coordinator.

Master of Science. The M.S. degree requires a minimum of 8 units of credit, of which 2 units are normally research credit for a satisfactory master's thesis. Students continuing on for the Ph.D. degree may petition to bypass the writing of a master's thesis and upon passing the preliminary examination, may petition to receive the M.S. degree. In exceptional circumstances, terminating students may petition to obtain the M.S. degree without completing a thesis. At least 3 units of course work must be taken within the department, and at least 3 units must be completed at the 400 level. A student must maintain the Graduate College minimum grade-point average of 3.75 (A = 5.0) during the master's program. In addition, each student must pass a written comprehensive examination. The program is normally completed in one to two years.

Master of Science in the Teaching of Earth Science. Candidates must earn 8 units, including 4 units in geology, 2 units in other earth science areas, and 2 units in education. At least 3 units must be at the 400 level. In addition, candidates must fulfill the requirements to be certified to teach at the secondary school level in Illinois. A student must maintain the Graduate College minimum grade-point average of 3.75 (A = 5.0) during the master's program. In addition, each student must pass a written comprehensive examination.

Doctor of Philosophy. The Ph.D. degree requires an additional 8 units of course work beyond the requirements for the master's degree and the completion of a satisfactory thesis, including 8 units of research and seminar. At least 4 of the 8 additional course units must be taken within the department and at least 3 of these units must be at the 400 level. At least 2 courses (totaling at least 1½ units) must be taken outside the geology department. A Ph.D. candidate must maintain a minimum grade-point average of 4.0 (A = 5.0) during all of his or her graduate work. A reading knowledge of German, Russian, or French is required. There are three faculty assessments of students' academic ability and progress: a written comprehensive, the preliminary, and the final examination. The written comprehensive examination surveys a student's background and preparation, and the results are used in planning individual programs. The preliminary examination is focused on a student's proposed research for the thesis and tests the student's preparedness for the proposed research. The final examination evaluates a student's research ability as demonstrated by the completed thesis. The doctoral program is normally completed in two to four years beyond the master's degree.

Financial Aid. Candidates for graduate degrees may be supported through teaching assistantships, research assistantships, fellowships, waivers of tuition and service fees, and work-study programs. Fellowships and assistantships include tuition and fee waivers. Awards for financial assistance are based principally on a candidate's academic record, statement of plans, and letters of reference. Some part-time assistants are employed by the State Geological Survey located on campus.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: JAMES M. MCGLATHERY

Correspondence and Information: Head, Department of Germanic Languages and Literatures, University of Illinois at Urbana-Champaign, 3072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E. H. ANTONSEN, H. G. HAILE, W. HÖLLERER, H. KNUST, R. LORBE, J. W. MARCHAND, J. M. MCGLATHERY, P. M. MITCHELL

Associate Professors: M. BURKHARD, U. H. GERLACH, M. KALINKE, K.-H. SCHOEPS, R. WRIGHT

Graduate Degree Programs. The Department of Germanic Languages and Literatures offers graduate programs leading to the degrees of Master of Arts, Master of Arts in the Teaching of German, and Doctor of Philosophy.

Master of Arts. Applicants should have completed undergraduate studies similar to the concentration in German at the University of Illinois at Urbana-Champaign, have a grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate course work plus any graduate work completed, and be able to follow lectures in the German language. Acquaintance with German history and culture in their relation to the general European background is desirable. Admission to the program is on a competitive basis.

Candidates for the Master of Arts in Germanic Languages and Literatures may emphasize either German or Scandinavian literature or linguistics. All candidates must take course work in both literature and linguistics.

Eight units of graduate work are required, although deficiencies in undergraduate preparation may necessitate more than 8 units to meet the requirements. Residence and other requirements of the Graduate College must be met. Candidates for the A.M. degree must demonstrate proficiency in reading one language other than English and German (normally French). Required courses (or approved equivalents) are: German 365 and 366 (Structure of the German Language I, II), German 311 and 312 (German Literature 750-1770), German 415 (Middle High German) or Scandinavian 405 (Old Norse-Icelandic), German 420 (History of the German Language), German 410 (Introduction to Graduate Study), and two graduate literature courses on the 400 level. Electives may be chosen from within or from outside the department with the approval of the graduate adviser. The degree is awarded upon the successful completion of a three-hour written and a one-hour oral comprehensive examination, or upon successful defense of a thesis. More detailed information may be obtained from the departmental office.

Master of Arts in the Teaching of German. Applicants must meet the same admission standards as those for the Master of Arts in German. Candidates for the M.A.T. degree must earn 5 units in German emphasizing either language and linguistics or literature and culture, 2 units in approved courses in educational policy studies, 1 unit of studies in educational foundations, and 2 courses in foreign language education. Candidates must also complete all undergraduate requirements for a teaching certificate, although no graduate credit is given for undergraduate courses. In some cases, with proper advance approval, graduate courses may be applied to the teaching certification requirements. Residence requirements are those of the Graduate College. The degree is awarded after the successful completion of a three-hour written and a one-hour oral examination. More detailed information is available from the departmental office.

Doctor of Philosophy. Applicants must meet the admission standards outlined for the Master of Arts and, in addition, hold a Master of Arts in German (or equivalent) with a graduate grade-point average of 4.5 (A = 5.0). Admission to the program is on a competitive basis.

Candidates for the Ph.D. in German may specialize in older German literature, modern German literature, or Germanic linguistics.

Students working toward the Ph.D. degree must have completed all requirements for the A.M. degree given above and complete an additional 8 units of course work approved by the graduate adviser. Residence requirements are those of the Graduate College. Candidates must demonstrate proficiency in reading two languages other than English and German that are considered useful in their area of specialization.

After passing the written preliminary examinations (three three-hour comprehensive examinations), the student is admitted to the oral examination, the successful completion of which admits the student to candidacy for the Ph.D. degree. The candidate must then complete 8 units of thesis research and successfully defend the

thesis in an oral examination. All candidates for the Ph.D. degree must have taught the equivalent of three one-semester courses on the college level (i.e., teaching one-half time for one academic year) before being admitted to the final oral examination (thesis defense). More detailed information is available from the departmental office.

Financial Aid. Teaching assistantships are awarded on a competitive basis to promising candidates with a strong academic record. Preference may be given to students who have lived in a German-speaking country or have had some teaching experience. Teaching assistantships are normally awarded one-half time for the academic year. Each year the department may nominate one or two outstanding students for a University Fellowship. A limited number of tuition and service fee waivers may also be available. Full details on amounts of financial aid and time limitations for eligibility may be obtained from the departmental office.

For continuing graduate students, the awarding of financial aid of all types is contingent upon the maintenance of satisfactory progress toward a degree.

Research Interests. The department faculty includes nationally and internationally recognized scholars in all areas of research within the field, including older and modern German literature, medieval studies, Scandinavian literature, German film, computerized instruction, and historical and synchronic Germanic linguistics. The University Library has one of the nation's outstanding collections of works pertaining to study and research in German and other literatures of all periods and in Germanic and general linguistics.

GOVERNMENT AND PUBLIC AFFAIRS

Acting Director of the Institute: P. F. NARDULLI

Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. F. GIERTZ, S. K. GOVE, P. F. NARDULLI

The Institute of Government and Public Affairs conducts policy-oriented research and public service. Primary emphasis is on research into public policy issues at the state and local level, especially as these relate to Illinois. Public service activities arise from and contribute to the research thrust through contact with public officials and the identification of research problems. Each year the institute has several affiliate faculty members from related University of Illinois at Urbana-Champaign departments, as well as from other universities. The institute offers no courses, but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research are published in internal and external journals and books.

HEALTH AND SAFETY STUDIES

Head of the Department: R. WARWICK ARMSTRONG

Correspondence and Information: Director of Graduate Studies, Department of Health and Safety Studies, University of Illinois at Urbana-Champaign, 114 Huff Hall, 1206 South Fourth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R. W. ARMSTRONG, W. H. CRESWELL, JR., R. G. MORTIMER, L. B. O'REILLY, T. W. O'ROURKE, D. B. STONE

Associate Professors: P. B. IMREY, L. RUBINSON

Assistant Professor: D. M. MACRINA

Graduate Degree Programs. The Department of Health and Safety Studies offers programs of study leading to the Master of Science and Doctor of Philosophy degrees. At the master's degree level, the program offers options in school health, safety and occupational health, and community health education. The community health program has been accredited by the Council on Education for Public Health. The Ph.D. program is designed to prepare graduates for positions of leadership in teaching, research, and service in universities, industries, and private and government agencies in the United States and in other countries. Opportunities are available for graduate students who desire to concentrate in additional public health areas through an intercampus program with the School of Public Health, University of Illinois at Chicago.

Admission. The Graduate College admission requirements apply for all applicants. Candidates wishing admission to the M.S. program will have their grade-point averages computed for their last 60 semester hours of undergraduate courses (excluding student teaching, field work, or activity courses). In addition, satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination are required.

The admission requirements for the Ph.D. program include the following: an acceptable grade-point average in the last 60 hours of undergraduate course work (not including student teaching, field work, or activity courses), an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test, and satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination. Candidates are required to have a personal interview with the director of graduate studies or other representatives of the department. Preference is given to students who have had at least two years of professional experience.

Master of Science. The program for the Master of Science degree (school health option) is normally completed in one year of full-time study. Eight units of work are required, including the following: 6 units in health education, 1 unit of which may be in approved courses closely related to health education, and presentation of an acceptable thesis (2 units). Candidates may petition to waive the thesis but will be required to take 2 units in lieu of thesis credit. Students must take an additional unit of course work in educational statistics if they did not complete a course of a similar nature with a grade of B or better in their undergraduate study.

The community health option generally takes two years depending upon prior education and experience. Twelve units of work are required, including 4 units in the core courses which are intended to provide the student with an overall knowledge of the public health field and the tools necessary for successful functioning as a community health specialist; 3 to 5 units of community health–related electives; 2 units of field work experience in the summer; and presentation of an acceptable thesis or research project (1 to 3 units).

The program of study in the safety and occupational health option requires a minimum of 8 units. Two units are fulfilled by satisfactory completion of a thesis which is required for the degree. In addition, students who have not had at least one undergraduate course in statistics with a grade of B or better will be required to take an additional unit of course work in educational statistics. Three and three-fourths units of work are required in occupational health and safety related courses. The remaining courses may be elected to emphasize the student's major area of interest in safety and occupational health.

Doctor of Philosophy. A master's degree with a thesis or equivalent is required for applicants to the Ph.D. program. Graduate course experience in public health, safety, ecology, epidemiology, and statistics with grades of B or better is expected prior to admission. Before admission to the Ph.D. program, students may be required to take up to 3 units of additional course work to remedy deficiencies. Candidates for the degree must complete a minimum of 16 units of credit beyond the master's degree, including the following: two Health and Safety Studies 400-level courses in area of specialization; one Health and Safety Studies 490 research seminar; one 400-level course in advanced quantitative methods; one minor for a minimum of 4 units, or two minors for a minimum of 2 units each (in both cases outside the major field); and completion of an acceptable dissertation (8 units). In addition, candidates must

demonstrate the ability to speak and read in two foreign languages, or complete 4 units of research skill courses; or demonstrate the ability to speak and read in one foreign language and complete 2 units of research skill courses. The candidate is required to pass written preliminary examinations covering health and safety, application of social science, epidemiology and ecology, research and quantitative methods, the major area of specialization, and the minor field; to pass an oral preliminary examination on the area of specialization and dissertation proposal; and to pass an oral defense of dissertation research.

Financial Aid. Financial aid is available on a competitive basis to qualified students in the form of teaching and research assistantships and tuition and service fee waivers.

Faculty Research Interests. Faculty research interests cover a wide range including, but not limited to, health education, school health, community health development, health behavior, health policy, health planning and management, life-span development, elderly care, human factors, safety and accident prevention, environmental health, occupational health, epidemiology, biostatistical and epidemiologic research methodology, and evaluation research.

Medical Scholars Program. This program allows the student interested in medicine and health and safety to earn both the M.D. and Ph.D. (health and safety studies) degrees while gaining multidisciplinary research experience. Individually tailored programs can be developed within the requirements of both programs. Degree work will be arranged to accommodate the schedules of both programs. However, the course of study in health and safety will be equivalent to that of all other doctoral candidates. Contact the Associate Dean, School of Basic Medical Sciences and Clinical Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801, for further information regarding the Medical Scholars Program.

HISTORY

Chairperson of the Department: WILLIAM C. WIDENOR
Director of Graduate Studies: DONALD D. QUELLER
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: W. L. ARNSTEIN, P. P. BERNARD, R. W. BURKHARDT, JR., R. B. CRAWFORD, D. E. CRUMMEY, C. E. DAWN, L. E. EASTMAN, P. B. EBREY, W. D. FARNHAM, R. T. FISHER, JR., K. A. HITCHINS, F. C. JAHER, R. W. JOHANNSEN, B. B. KLING, J. L. LOVE, R. M. MCCOLLEY, J. P. MCKAY, J. A. NICHOLS, D. E. QUELLER, P. W. SCHROEDER, W. U. SOLBERG, C. C. SPENCE, C. C. STEWART, H. J. WECHSLER
Associate Professors: J. BUCKLER, O. V. BURTON, C. M. HIBBARD, R. C. JENNINGS, T. A. KRUEGER, J. A. LYNN, E. M. MELHADO, R. E. MITCHELL, J. H. PRUETT, M. L. SPENCE, R. P. TOBY, B. P. UROFF, J. E. K. WALKER, W. C. WIDENOR
Assistant Professors: J. R. BARRETT, N. JACOBSEN, D. P. KOENKER

Graduate Degree Programs. The Department of History offers graduate courses leading to the Master of Arts and the Doctor of Philosophy, complete details of which may be found in the department's brochure on graduate study in history. The Master of Arts degree may be either the first stage in preparation for the degree of Doctor of Philosophy or a terminal degree. A special program for teacher training is available, the Master of Arts in the Teaching of Social Studies (see page 167).

Approved areas of specialization are: ancient Greece; ancient Rome; medieval; Renaissance and Reformation; Europe and dependencies, 1648-1815; Europe and dependencies since 1815; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; early America to 1830; United States since 1815; Latin America; history of science; history of international relations since 1871; Afro-

American history; native American history; history of medicine; and history of women. Topical fields may also be arranged with the consent of the graduate advisers.

Admission. For the A.M. program: an average of 4.0 (A = 5.0) during the last two years of undergraduate work, a reasonable amount of course work in history, and Graduate Record Examination scores (verbal and quantitative mandatory; history optional). For the Ph.D. program: an average of 4.5 for previous graduate-level work and Graduate Record Examination scores (as above). Undergraduate language preparation may be weighted heavily depending upon field of specialization.

Master of Arts. Candidates are expected to take at least 2 units in each of two of the fields of specialization listed above. A minimum of 8 units is required, 4 of which must be at the 400 level (excluding History 498). One of the 8 units must be History 490 (history and social theory), 491 (quantitative history), or 496 (historiography). At least one research seminar with a grade of B or better must be included. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement and may carry no more than 2 units of credit. A candidate must demonstrate ability to read one foreign language related to his or her field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the Ph.D. degree needs a minimum of 24 units (including those offered for the A.M. degree), of which 8 may be for thesis research (History 499). For students who enter the graduate program without an A.M. in history, these must include three research seminars, History 496, either History 490 or History 491, and three additional courses at the 400 level (not including History 499). For students entering the graduate program with an A.M. in history, these must include two research seminars, History 496, either History 490 or History 491, and two additional courses at the 400 level (not including History 499). History 498, while required for students serving as teaching assistants, cannot be counted toward fulfilling these requirements. A candidate must demonstrate ability to read two foreign languages related to his or her field of interest, as approved by the graduate advisers. In certain circumstances, a student in American or British history may substitute courses in quantitative skills for the second language. For the preliminary examination, the candidate will customarily offer four fields in history, of which one must involve a period of time prior to 1815. At least two geographical areas must also be represented by the fields offered for the examination. One of the four fields, however, may be in a specialization outside the Department of History or may be a field of history specially designed by the candidate in consultation with the major adviser (e.g., United States intellectual or European economic history). Four units in disciplines other than history may be applied to fulfill the minimum requirement of 24 units.

Concentration in the Area of American Civilization. The Department of History administers an interdisciplinary doctoral program in American civilization. Students are required to take, among their 16 units prior to preliminary examinations, at least 4 units in American history, 3 in literary studies, 2 in the fine arts, and 2 in the social sciences. Course work may be arranged to allow specialization in such interdisciplinary fields as popular culture, urban studies, regional studies, folklore, film, women's studies, and minority cultures. Students may earn a master's degree in American civilization by taking 8 units, including 3 in history, 2 in literature, and 2 in either the fine arts or the social sciences. At least 4 of these units must be at the 400 level, and one should represent an interdisciplinary research project. Students apply for admission and financial aid through the Department of History.

Concentration in the Area of History and Philosophy of Science. The Departments of History and Philosophy jointly offer, for work toward the A.M. and the Ph.D. degrees, a special area of concentration in history and philosophy of science. Students interested in this program will enroll in and receive their degrees from either the history or the philosophy department depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history or philosophy is normally desirable, so also is a strong background in science, and students with such back-

grounds, but only weak training in history or philosophy, will be considered for admission. The admission procedure is the same as that stated for each of the two departments, as is the information to be submitted with each application for admission. For students in this special concentration, the normal departmental requirements for the A.M. and Ph.D. degrees are modified. Further information is available from the Department of History.

Financial Aid. Financial aid is almost always awarded on an academic-year basis. Applications are due in the department office by January 15. All fellowships and assistantships involve a stipend plus tuition and service fee waiver.

Fellowships. Available fellowships include University Fellowships for entering A.M.-level students and for Ph.D.-level students at the dissertation writing stage, Babcock Fellowships for dissertation-level students, Foreign Language and Area Studies (NDEA VI) Fellowships for those who have special interests in foreign area studies, and Graduate College Fellowships for beginning students who have disadvantaged backgrounds.

Teaching Assistantships. Half-time teaching assistantships are the department's primary form of financial aid to graduate students admitted to the Ph.D. program. Students who make satisfactory progress toward their degree and demonstrate effective teaching will have their teaching assistantships renewed for a second and, in some cases, a third year.

Tuition and Service Fee Waivers. A number of tuition and service fee waivers are available each year both to entering and continuing students at the A.M. and Ph.D. levels.

HISTORY AND PHILOSOPHY OF SCIENCE

Graduate Degree Program. An interdisciplinary concentration in the history and philosophy of science is available leading to the Master of Arts or Doctor of Philosophy degree. Students for this program enroll in either the Department of History or the Department of Philosophy. Further information may be obtained from those departments or the School of Humanities.

HORTICULTURE

Acting Head of the Department: D. B. Dickinson

Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 124 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. B. Dickinson, W. L. George, C. A. Rebeiz, D. S. Seigler, R. K. Simons, W. E. Splittstoesser, L. A. Spomer, J. S. Titus

Associate Professors: J. O. Dawson, J. M. Gerber, M. M. Meyer, S. M. Reis, R. M. Skirvin, D. S. Wehner, D. J. Williams

Assistant Professors: B. A. Eisenberg, T. W. Fermanian, J. A. Juvik, G. J. Kling, S. S. Korban, W. J. Sherry, M. A. L. Smith, J. G. Sullivan, J. M. Swiader

Graduate Degree Programs. Graduate work is offered in the Department of Horticulture leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in any phase of horticulture (fruit and vegetable crops, ornamentals, and turf) including breeding and genetics, culture and production, weeds and their control, environmental physiology, biochemistry, developmental anatomy and morphology, tissue culture, or marketing. A well-balanced program may include courses in agronomy (crops and soils), botany, food science, genetics, statistics, entomology, plant pathology, chemistry, biochemistry, agricultural economics, and agricultural communications.

Admission. Applicants should have a bachelor's degree in horticulture or equivalent preparation in the plant sciences and must meet the Graduate College requirements for admission.

Master of Science. A candidate must complete a minimum of 8 units of graduate study with a grade-point average of at least 4.0 (A = 5.0); at least 4 units must be in the 400 series of courses. Thesis and nonthesis options are available; however, the thesis option is preferred and is required of all research assistants. Any request for the nonthesis option is considered on its individual merit by the graduate committee of the department.

Doctor of Philosophy. The candidate must complete a minimum of 8 units of course work beyond the master's degree and pass a preliminary examination. The candidate must also complete 8 units of thesis research, submit an acceptable thesis, and defend it in an oral examination. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee. Additional details of departmental graduate degree requirements are described in a pamphlet available from the Department of Horticulture.

Financial Aid. Various support monies available on a competitive basis include University Fellowships, College of Agriculture fellowships, research and teaching assistantships, and waivers of tuition and service fees.

HUMANITIES

Director of the School: NINA BAYM

Correspondence and Information: School of Humanities, University of Illinois at Urbana-Champaign, 112 English Building, 608 South Wright Street, Urbana, Illinois 61801

The School of Humanities, an association of thirteen departments and programs in the humanities, maintains cooperative relationships with allied departments in other colleges. The school includes the Departments of the Classics; English; French; Germanic Languages and Literatures; History; Linguistics; Philosophy; Slavic Languages and Literatures; Spanish, Italian, and Portuguese; and Speech Communication; the Programs in Comparative Literature and Religious Studies; and the Division of English as a Second Language; it also administers the Language Learning Laboratory. The master's and doctoral degree programs offered in the graduate units in the School of Humanities are described in individual entries in this catalog for each field of study.

The various departments and programs include almost 260 faculty members and approximately 400 graduate teaching and research assistants. The School of Humanities' primary responsibility is to promote humanistic teaching, research, and public service both in the traditional disciplines and in interdisciplinary fields. In addition to traditional fields of study, the school also offers various special and interdisciplinary subjects including cinema studies, American civilization, medieval civilization, and Renaissance studies. A graduate certification program is offered in criticism and interpretive theory, and master's and doctoral programs are available in American civilization and the history and philosophy of science. These programs and the work of individual degree candidates are supervised by interdisciplinary advisory committees.

HUMAN RESOURCES AND FAMILY STUDIES

Acting Director of the School: COBY B. SIMERLY

Correspondence and Information: School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 274 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. M. Dunsing, B. P. Klein, F. M. Magrabi, M. F. Picciano
Associate Professors: K. A. Anspach, A. H. Beller, L. L. Birch, H. M. Buckley, J. S. DeLoache, N. J. Fisher, J. L. Hafstrom, M. A. Khan, D. K. Layman, B. J. Peterson, M. Raheel, R. J. Reber, S. B. Salamon, A. R. Sherman
Assistant Professors: M. A. Carll-White, C. J. Carpenter, S. U. Douglas, R. Hughes, K. S. Keim, R. W. Larson, M. A. Morganosky, W. H. Sander III, V. R. Schram, M. P. Sherman, C. A. Surra, J. L. Wysocki

Graduate Degree Programs. The School of Human Resources and Family Studies offers graduate work leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. Master's degree programs are available in family and consumption economics, foods and nutrition, general human resources and family studies, human development and family ecology, and textiles and apparel. Doctoral degrees are offered in family and consumption economics and in foods and nutrition. Requirements for these are listed under the individual programs.

For the master's degree in human resources and family studies, all candidates must complete a minimum of 8 units (9 if a thesis is not submitted) of which at least 4 must be in human resources and family studies. Four of the total units, including at least 2 in human resources and family studies, must be in 400-level courses.

The minimum grade-point average for admission is 4.0 (A = 5.0). Additional requirements are listed under the individual programs.

INDIVIDUAL DEGREE PROGRAMS

Family and Consumption Economics. The family and consumption economics programs are interdisciplinary. Admission requirements include one semester of principles of economics, a course in applied statistics, and one in calculus. Major areas of faculty research include satisfaction related to levels and standards of living and quality of living for families and individuals, and human capital with emphasis on education and employment of women.

Master of Science. The M.S. program requires 3 units from family and consumption economics, 2 units of thesis from Family and Consumption Economics 499, 2 units of economic theory at the 400 level, and 1 unit of research methods.

Doctor of Philosophy. Requirements include: (1) 5 units from family and consumption economics; 2 units from economic theory; 2 to 4 units at the 400 level from economics or, economics and agricultural economics; 2 units of statistics; 1 unit of research methods; 8 units of thesis, Family and Consumption Economics 499; (2) two of the three stages must be in residence; and (3) three written examinations, one in family economics, one in consumption economics, and one in economic theory.

Foods and Nutrition. Major areas of faculty research interest include human nutrition through the life cycle; nutritional aspects of exercise; nutrient metabolism; nutrition and immunity; nutrition education; nutrient composition of foods; food service systems; sensory and instrumental evaluation of food quality; food biochemistry; and use of alternative protein sources in human food.

Master of Science. The department offers two areas of emphasis for the M.S. degree: foods and nutrition, and food service systems. For admission, candidates must have training in organic and inorganic chemistry, algebra, microbiology, and physiology, as well as an undergraduate course in both foods and nutrition with organic chemistry prerequisites. Deficiencies must be removed during the first year of graduate study. For both emphases, a minimum of 8 units, of which at least 4 must be in foods and nutrition, must be completed. Four of the total units, including at least 2 in foods and nutrition, must be in 400-level courses. Thesis topics may be in foods, nutrition, or food service systems. Specific entrance requirements and course work required for each area are given below. Additional courses may be taken in foods and nutrition or related areas.

In the foods and nutrition emphasis, a course in quantitative analytical chemistry is an additional requirement for entrance. Graduate-level courses required include

biochemistry with laboratory, biochemical nutrition, experimental study of foods, and seminars in foods and nutrition. In the food service systems emphasis, introductory courses in accountancy, business administration, and economics are additional requirements for entrance. Required foods and nutrition graduate-level courses include the experimental study of food; quantity food purchasing, production, management, and service; and seminars in foods and food service systems. In addition, personnel management, business organization, and marketing courses at the graduate level are required.

Doctor of Philosophy. For admission, in addition to the prerequisites listed above for the master's degree, a candidate must have taken courses in calculus and physics. Twenty-four units of graduate work must be completed; at least 8 and no more than 12 units of thesis research may be applied to the requirements. If a candidate has a master's degree in foods and nutrition or a related area, a minimum of 16 units, including up to 12 units of thesis research, must be completed. Required courses include at least 3 units of foods and nutrition, of which at least 2 must be at the 400 level. Students must take seminars in foods, nutrition, or food service systems. Other courses are selected on the basis of the student's background and interests, in consultation with the adviser. Courses may be chosen from foods and nutrition, food science, biological and chemical sciences, statistics, or other related areas. Thesis topics may be in foods or nutrition.

General Human Resources and Family Studies. The master's program in general human resources and family studies allows the candidate to obtain greater breadth than is possible in one of the more specialized areas. Candidates are required to take a minimum of 4 units from prescribed courses in three of the five specialized fields in human resources and family studies.

Home Economics Education. The M.S. program in home economics education requires that candidates hold a valid teaching certificate for home economics or have successfully completed Illinois certification requirements, and earn at least 8 units of graduate credit, of which 4 units are in human resources and family studies. Three of the 8 units must be at the 400 level, with at least 1 of these in human resources and family studies. Four ½-unit courses are specified in educational psychology and educational policy studies. At least 2 units must be in home economics education. Advisers for students in this program are in the Division of Home Economics Education.

Human Development and Family Ecology. For the M.S. or A.M. degree in human development and family ecology, the student may specialize in the study of either the family or life-span human development. Major areas of research include child, adolescent, and adult development; family interaction/ecology; developmental family studies; gerontology; cognitive development; family problems; abnormal development; social competency; child advocacy/parent education; and service programs/administration. Minimum admission requirements include previous course work in an area of the behavioral/social sciences. Admission to the master's degree program is based on a combination of criteria. Applicants should have some background in the behavioral, physical, and/or biological sciences and must have completed an advanced course in both statistics and research methods. Students not meeting these requirements must remedy any deficiencies during their first year in the program. For the degree, candidates must complete a minimum of 8 units, including 2 units of thesis, or 9 units if a thesis is not submitted. Four of the total units must include H.D.F.E. 418 and 419 and two other 400-level courses.

Joint Master's Degrees for the Specialization in Marital and Family Therapy. For admission to the M.S.W.-M.S. joint degree program, students may apply to either the School of Social Work or the Department of Human Development and Family Ecology, but they must meet the standards for admission and be approved by both. Preference will be given to students with prior course work in the social and behavioral sciences, applied statistics and research methods, and previous experience in human services. The program is designed to prepare students for careers as marital and family therapists within a human service agency, as independent practitioners, teachers,

or clinical researchers. Completion of the program meets the requirements for associate membership in the American Association for Marriage and Family Therapy. Students who hold a B.S.W. degree must complete a minimum of 20 units of course work to satisfy requirements for the M.S.W. and M.S. degrees. Students with baccalaureate degrees in other disciplines may need to complete up to 22 units if they lack certain social work credits as undergraduates.

Textiles and Apparel. For the M.S. or M.A. degree in textiles and apparel, the student may specialize in the study of the social-psychological aspects of dress, cross-cultural analysis of dress, aesthetic aspects of apparel, textile and apparel marketing, and textile science. Major areas of research include international and domestic textiles and apparel economics, cognitive and interpersonal factors influencing apparel selection, consumer value and apparel purchase behavior, history of textiles and costume, protective and safety aspects of textiles, physical testing of textiles and textile products.

Master of Science or Master of Arts. For admission, candidates must have had basic courses in the following areas, based on program direction: apparel, textiles, art, chemistry, economics, sociology, and psychology. Deficiencies may be made up the first year of graduate study. A minimum of 8 units, of which at least 4 must be in textiles and apparel, are required, or 9 units if a thesis is not submitted. Four of the total units must be in 400-level courses, including 2 units of thesis. A graduate-level statistics course also is required. Additional courses are selected in accordance with special interests of students.

Financial Aid. University Fellowships and fellowships in the College of Agriculture, tuition and service fee waivers, research assistantships, and teaching assistantships are available in several programs.

JOURNALISM

Head of the Department: THOMAS B. LITTLEWOOD
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. CAREY, T. LITTLEWOOD, T. PETERSON
Associate Professors: C. CHRISTIANS, S. HELLE, R. REID, C. WHITNEY

Graduate Degree Program. The Department of Journalism offers graduate work leading to the Master of Science degree. The department does not offer a Ph.D. degree. For the program leading to the Doctor of Philosophy in Communications, see page 96.

Admission. Applicants must have a bachelor's degree from an accredited U.S. institution or one of recognized standing abroad. A grade-point average of 4.0 (A = 5.0) is the minimum requirement for admission to the Graduate College, with exceptions by petition only. Because the master's program has an enrollment ceiling, some applicants with grade-point averages of 4.0 or higher may not be admitted. It is imperative that all applicants supply writing samples. Letters of recommendation and the Graduate Record Examination are required. If possible, a personal interview with the head of the department or director of graduate studies is also helpful.

Master of Science. The following are requirements for the degree: (1) A major of 4 units or 3 units and 1 additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience are required to complete 1 unit of news editing (either news-editorial or broadcast news editing), 2 units in news writing, and 1 unit of either graphics and photojournalism, television, or radio news production. (2) A thesis, or preparation of a topic in journalistic form for publication or broadcast, for 1 unit. (3) A minimum of 3 units

in courses at the 400 level, at least 2 of which must be in journalism. (4) A minimum total of 8 units with a grade-point average not lower than 3.875.

Financial Aid. See the description of the University Fellowship and tuition and service fee waiver program in the introductory section of this catalog. Assistantships (teaching or research) are awarded on a one-quarter–time to two-thirds–time basis at a salary of not less than $2,300 to $6,132 for the academic year. Assistantships carry a waiver of tuition and fees (except the health service and insurance fees). To be considered for financial aid, applications, including transcripts and three letters of recommendation, must be received no later than February 15. Students with journalism degrees or professional experience may become candidates for part-time positions in other units of the University that require journalistic skills in writing, editing, and/or photography and graphics.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: W. FRANKE
Correspondence and Information: Assistant Director, Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: F. D. BLAU, P. FEUILLE, W. FRANKE, P. HARTMAN, W. HENDRICKS, C. HULIN, L. KAHN, B. KARSH, G. OLDHAM, M. ROTHBAUM, K. TAIRA, H. TRIANDIS
Associate Professor: J. LAWLER
Assistant Professors: P. CAPPELLI, F. DRASGOW, B. ROACH, P. SHERER
Professors Emeriti: M. DERBER, W. FORM, M. WAGNER

Graduate Degree Programs. The Institute of Labor and Industrial Relations (L.I.R.) offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. Students must meet the general admission requirements of the Graduate College as well as the specific requirements of the institute.

Graduate study at the institute is based on a multidisciplinary approach to industrial relations problems and a flexible curriculum. To achieve this, the institute has joint faculty appointments and course listings with economics, psychology, sociology, and business administration; and joint course listings with law, political science, vocational education, and social work.

Master of Arts. The master's program can lead to a professional, terminal A.M. degree, or it can prepare students to continue their graduate study toward a Ph.D. degree or doctoral degrees in law and other professional areas. The fields of concentration are: unions, management, and labor relations policy; organizational behavior and personnel management; and labor markets and employment.

The institute offers a number of program options for the A.M. degree. All options require a minimum of 10 units of work and normally take three semesters to complete. All of the master's degree programs have core requirements in industrial relations systems, quantitative methods, and research methods.

Admission to the master's program is based on an applicant's undergraduate record, letters of reference, Graduate Record Examination scores, and statement of interest and goals. Normally, the minimum requirements for admission are a course in statistics and an average grade of B in the last 60 hours of undergraduate work. A deficiency in statistics may be made up by taking the required course without graduate credit during the first semester of graduate study.

Joint J.D./A.M. The joint degree program with the College of Law leads to the J.D. and the A.M. degrees in labor and industrial relations in three-and-one-half years. Students must apply to both the College of Law and the Institute of Labor and Industrial Relations and must be accepted by both units.

Doctor of Philosophy. The Ph.D. program in labor and industrial relations is an interdisciplinary research degree. An individual program is built around the student's

area of specialization. It includes industrial relations theory, research methodology, and course work both in a major social science discipline and in other professional and disciplinary subjects relevant to the interdisciplinary area of specialization. Examples of areas of specialization include: government employer-employee relationships; labor in politics; economic effects of collective bargaining; discrimination in employment; wage policy issues in economic development; motivation, morale and job satisfaction; international comparative industrial relations systems; behavior in union and management organizations; interorganizational relations; work design; pay systems; cross-cultural issues in industrial relations; and structural and technological determinants of human behavior. The Ph.D. degree requires 24 units of credit beyond the baccalaureate degree, satisfactory completion of qualifying examinations in industrial relations theory and the area of specialization, and a thesis.

A student interested in earning a Ph.D. degree after receiving a master's degree at the institute should indicate this fact on the application for admission. Students with outstanding undergraduate records or with a master's degree from another institution may apply for entrance directly to the doctoral program. The degree should be in labor and industrial relations or an allied field such as business administration, economics, history, sociology, political science, or psychology. The applicant should submit with the application evidence of research competence (master's thesis, term papers, an undergraduate thesis, special reports, or published articles). All papers will be returned.

Financial Aid. The institute offers research assistantships to high-ranking graduate students and to new students whose undergraduate records are superior. Assistantships pay a salary plus exemption from tuition and service fees. The Graduate College awards fellowships which carry stipends plus tuition and service fee waivers. Tuition and service fee waivers may also be granted but do not carry a stipend.

LANDSCAPE ARCHITECTURE

Head of the Department: V. J. Bellafiore
Coordinator of the Graduate Program: Terence G. Harkness
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 214 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: V. J. Bellafiore, T. G. Harkness, L. D. Hopkins, J. A. Jakle, W. M. Keith, R. B. Riley, E. S. Weidmann
Assistant Professors: M. D. Cairns, G. B. Kesler, B. A. Orland

Graduate Degree Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture. The program is designed to enable students to gain fresh insights and to experiment with new applications pertaining to land and its use by people. Courses and faculty research activities are concentrated in land resources planning, design-behavior interaction, the cultural and historical landscape, and computer applications from site to regional scale. Before submitting an application, students should obtain a pamphlet from the department which describes the specific areas of study and the time needed to complete the requirements.

Admission. The Graduate College admission requirements apply. Students are admitted on an individual basis according to a review of their prior accomplishments with an emphasis on academic achievement. Candidates from undergraduate design programs must submit samples of their design work with their applications. Candidates without undergraduate preparation in landscape architecture will be admitted on limited status and must complete undergraduate prerequisite courses in addition to graduate work.

Master of Landscape Architecture. A student must complete a minimum of 12 units with at least 6 units taken within the department and at least 3 units of electives

chosen from courses offered outside the department. At least 4½ units must be taken in 400-level courses. Specific courses to be taken are determined in consultation with an adviser. These courses must culminate in either a master's project (Landscape Architecture 498) or a master's thesis (Landscape Architecture 499), that permits the student to pursue in depth and independently a project of particular interest, to synthesize knowledge and skills from previous course work, and to demonstrate competence to do work of professional caliber.

Financial Aid. Students compete for fellowships, tuition and service fee waivers, and assistantships.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center: ENRIQUE MAYER

Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. ALEXANDER, W. BAER, W. BLAYLOCK, C. DEAL, F. DOVRING, F. FLIEGEL, R. FINDLEY, E. GARFIELD, D. GROVE, J. HILL, J. KARR, D. LATHRAP, J. LOVE, A. PASQUARIELLO, R. REISNER, M. SALTARELLI, S. SCHMIDT, J. SCHULMAN, R. SCOTT, J. THOMPSON, R. TROIKE, J. VAN ES, J. WARFIELD, N. WHITTEN, B. YATES, R. ZUIDEMA

Associate Professors: A. AIEX, C. AUGSPURGER, D. COES, P. COLE, M. LEWIS, E. MAYER, T. MEEHAN, M. PALENCIA-ROTH, M. SOLAUN

Assistant Professors: P. BORGESON, S. BROWN, P. GARBER, N. JACOBSEN, D. STIGBERG, J. WATANABE

Graduate Degree Programs. Graduate minors in Latin American and Caribbean studies are administered by the director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin American and Caribbean studies must complete 2 units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete 4 units for one minor or 2 units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center. A combined graduate program in Agricultural Economics and Foreign Area Studies (in this case, Latin American Studies) is also available.

Students in technical and professional colleges and schools of the University of Illinois at Urbana-Champaign who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the director of the center or with their advisers in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American and Caribbean area for government, private business, publishing, or religious organizations.

Language Instruction. The Center offers Quechua, the native language spoken by 10½ million people in the Andean republics.

LAW

Dean of the College: PETER HAY

Director of Graduate and International Legal Studies: R. REISNER

Correspondence and Information: College of Law, University of Illinois at Urbana-Champaign, 209 Law Building, 504 East Pennsylvania Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: M. W. Benfield, F. A Boyle, C. B. Craver, J. E. Cribbet, R. W. Findley, G. T. Frampton, S. L. Harris, P. H. Hay, R. L. Kaplan, H. D. Krause, W. R. LaFave, P. B. Maggs, R. L. Marcus, J. H. McCord, J. E. Nowak, W. H. Painter, R. Reisner, R. D. Rotunda, E. F. Scoles, E. W. Shoben, V. J. Stone

Associate Professors: W. J. Davey, M. Hoeflich

Assistant Professors: G. Bradley, D. A. Dripps, E. Freyfogle, K. Kinports, J. E. Lopatka, T. Mengler, A. L. Merritt, D. J. Merritt, H. G. Prince, L. A. Reynolds, S. Ross, C. J. Tabb

Graduate Degree Programs. The College of Law offers a program of graduate work leading to the Master of Laws, Master of Comparative Law, and Doctor of the Science of Law.

Master of Comparative Law. A student whose undergraduate study in law has been in systems based on the Anglo-American common law is eligible to apply for candidacy for the Master of Laws or Doctor of the Science of Law. An international lawyer whose prior law study has been in a system which is not based on the Anglo-American common law may, in exceptional cases, be admitted to candidacy for Master of Laws or Doctor of the Science of Law, or such an international lawyer may apply for candidacy for the Master of Comparative Law. The Master of Comparative Law program is designed to develop facility in the comparative method and to prepare an international lawyer to deal knowledgeably with Anglo-American problems. Admission standards, as well as residency, grade-point average, and other requirements, except for a thesis, are substantially the same as for the Master of Laws and Doctor of the Science of Law programs.

Master of Laws and Doctor of the Science of Law. For admission, an applicant must have received a first degree in law from a law school which has graduation requirements substantially the same as the University of Illinois College of Law and must present evidence of ability to do satisfactory work at the graduate level. A candidate for the Master of Laws (LL.M.) must have a grade-point average of at least 4.0 (A = 5.0) in all law work previously undertaken.

Admission to candidacy for the Doctor of the Science of Law (J.S.D.) degree is granted only after the completion of two terms in residence. The decision to admit will be based on the applicant's outstanding performance in the courses taken as well as upon a demonstrated ability to produce a thesis of publishable quality.

One academic year in residence is required of a candidate for an advanced degree. The programs for the LL.M. and J.S.D. degrees consist of course work and research which have been approved by the committee on graduate study of the College of Law, comprising at least 8 units of graduate work, of which at least 2 for the master's degree and 4 for the doctoral degree must be in research. In addition to the course work and research, a thesis is required. For the master's degree, the thesis may be completed during the year in residence. For the doctoral degree, the thesis must be submitted not less than one year nor more than five years after the completion of the residence requirement, and the candidate must pass an oral examination before a committee of the faculty. The program for the Master of Comparative Law consists entirely of course work and must include satisfactory completion of Law 402, Introduction to U.S. Law. The candidate for the Master of Laws or the Master of Comparative Law degree must maintain a grade-point average of 3.5 in graduate or professional law courses and the candidate for the Doctor of Science of Law, an average of 4.0.

Financial Aid. The College of Law offers six instructorships to students whose backgrounds have been in the Anglo-American common law system and four research assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and service fees are available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by January 1.

LEISURE STUDIES

Head of the Department: JOSEPH J. BANNON
Correspondence and Information: Head, Department of Leisure Studies, University of Illinois at Urbana-Champaign, 104 Huff Gymnasium, 1206 South Fourth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: J. J. BANNON, R. J. BURDGE, R. E. HERRON, J. R. KELLY, G. C. ROBERTS
Associate Professors: L. BARNETT MORRIS, D. J. BRADEMAS, R. D. ESPESETH, D. A. KLEIBER, C. A. PETERSON
Assistant Professors: G. E. CHICK, L. C. GOODE, G. A. LOWREY, JR., W. R. MCKINNEY, N. H. NAVAR, B. SIRVIS, J. J. SNEEGAS, T. N. WESTOVER
Professor Emeritus: A. V. SAPORA

Graduate Degree Programs. The Department of Leisure Studies offers a program of study leading to the Master of Science and the Doctor of Philosophy degrees. The Master of Science program prepares supervisors and administrators for public parks and recreation systems, treatment centers for the ill and disabled, and various private and semipublic settings providing leisure services, or the M.S. degree may serve as the first step toward the Ph.D. program. The Ph.D. program is, in general, designed to develop educators and research personnel in the study of leisure behavior, the management of leisure service delivery systems, or both.

Admission. The Graduate College admission requirements apply. The departmental graduate committee considers the candidates' maturity, experience, and commitment to the field in making admission decisions. Specifically, the admission requirements are as follows: minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed; satisfactory verbal, quantitative, and analytical Graduate Record Examination scores; 15 semester hours of behavioral science; 8 semester hours of natural science; and an acceptable introductory statistics course. The previous degree field is of importance, and preference is given to those with a solid array of undergraduate courses in recreation or, for Ph.D. applicants, a master's degree in the field. Preference is also given to applicants who will be full-time students and active degree candidates.

Master of Science. A candidate for the M.S. degree must spend at least one semester on campus and complete a minimum of 8 units, 3 of which must be in the 400 series and 2 of the 3 in leisure studies. Four of these units should be in the student's area of specialization. A thesis may be written for 2 units of credit. A full-time student can complete the program in three or four semesters.

Doctor of Philosophy. A candidate for the Ph.D. degree must spend at least two years in residence and satisfactorily complete a minimum of 16 units beyond the master's degree. These units include the credit for the Ph.D. thesis. Two foreign languages are required, but this requirement may be waived provided 2 additional units of course work are substituted for each language. Graduate examinations include written preliminary examinations taken at the completion of formal course work, oral preliminary examinations on the proposed research of the thesis, and a final examination in defense of the doctoral thesis.

Financial Aid. The department offers one-quarter–time and one-half–time assistantships in both teaching and research. If possible, students should indicate a desire for this type of part-time employment when applying for admission.

LIBRARY AND INFORMATION SCIENCE

Dean of the Graduate School of Library and Information Science: LEIGH S. ESTABROOK
Correspondence and Information: Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, 410 David Kinley Hall, 1407 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. T. Choldin, C. H. Davis, H. Goldhor, K. L. Henderson, D. W. Krummel, F. W. Lancaster

Associate Professors: W. C. Allen, J. L. Divilbiss, S. Richardson, L. Smith, T. L. Weech

Assistant Professors: L. Auld, L. Edmonds, D. Shaw

Graduate Degree Programs. The Graduate School of Library and Information Science offers programs of study leading to the Master of Science, the Certificate of Advanced Study, and the Doctor of Philosophy degrees. The Master of Science degree program prepares men and women for professional careers in all types of libraries and information centers. The Certificate of Advanced Study program provides opportunity (a) to study an aspect of library and information science in greater depth than is possible in the Master of Science program, (b) to refresh and upgrade one's professional training several years after the Master of Science program, or (c) to redirect one's career into a different area of library and information science. The Doctor of Philosophy is a research degree program.

Admission. In addition to the general admission requirements of the Graduate College, consideration is also given to language study, relevant work experience, letters of reference, Graduate Record Examination aptitude test scores, and evidence of leadership. International students must score at least 600 on the Test of English as a Foreign Language. The Certificate of Advanced Study and Doctor of Philosophy programs require a master's degree in librarianship from a library school with an A.L.A.-accredited program and a grade-point average of at least 4.0 (A = 5.0) in the master's program. For the Doctor of Philosophy program, two years of library work experience at the professional level and an interview with the school's advanced studies committee are also required.

Master of Science. Ten units of graduate study, including 1 unit of Library and Information Science 300, a ½ unit of Library and Information Science 307, and a ½ unit of Library and Information Science 320 are required of all students. Possible areas of specialization include all main types of libraries (e.g., academic, public, school, and special), all main types of work in libraries (e.g., cataloging, reference, and children's services), plus other concentrations such as information science, library automation, rare books, and archives. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A thesis is not required but is available as an option. A minimum of twelve months is required to complete the master's program.

Certificate of Advanced Study (C.A.S.). The certificate is awarded upon the successful completion of 10 units of graduate course work beyond the master's degree. Of the 10 units, at least 6, including Library and Information Science 459 (C.A.S. Project), must be in library and information science. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A minimum of twelve months is required to complete the C.A.S. program.

Doctor of Philosophy. The program consists of three stages: (1) generalization (9 units of course work required of all doctoral students), (2) specialization (3 or more units of elective course work plus a research tool), and (3) thesis (8 or more units). Thus, a minimum of 12 units of graduate course work plus 8 units of thesis credit are required. A minimum of two years is required to complete the necessary course work; an additional year or more, preferably in residence, is required for the thesis.

Financial Aid. Financial aid is available from the school, the University of Illinois Library, area libraries, and the like, in the form of graduate assistantships, preprofessional positions, and hourly paid work. Also, the school has a limited number of fellowships and tuition waivers for which doctoral students tend to be favored over C.A.S. and master's students.

Research Interests, Facilities, and Resources. Major areas of faculty research interest include bibliography, cataloging and classification, information storage and retrieval, library automation, nonprint media, library services for children and young adults,

and reference tools and services. The school's Library Research Center engages in applied and pure research on contract; staff members of the Library Research Center are available to students and faculty for consultation and guidance. The University of Illinois Library provides a vast reservoir of resources for all types of study and research in library and information science.

The school maintains an ongoing commitment to continuing education through conferences, institutes, workshops, and special course offerings. Of particular note are the annual Allerton institutes and clinics on library applications of data processing. An extensive publications program includes the annual *Proceedings* of each of these, plus *Library Trends, Occasional Papers,* and a variety of monographs.

LIFE SCIENCES

(Including Interdepartmental Biology Programs; Anatomical Sciences; Ecology, Ethology, and Evolution; Entomology; Genetics and Development; Microbiology; Physiology and Biophysics; and Plant Biology)

Director of the School: SAMUEL KAPLAN
Correspondence and Information: Director of the School of Life Sciences, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

Graduate Degree Programs. The School of Life Sciences includes the Departments of Anatomical Sciences; Ecology, Ethology, and Evolution; Entomology; Genetics and Development; Microbiology; Physiology and Biophysics; and Plant Biology. Study programs leading to the graduate degrees of Master of Science and Doctor of Philosophy exist in each of the departments and are described in detail on the following pages. In addition, interdepartmental study programs leading to the Ph.D. degree in cell biology, ecology, neural and behavioral biology, and plant physiology are administered within the school.

Financial Aid. Support for graduate training is available in the form of teaching or research assistantships and University Fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department or for interdepartmental study programs from the School of Life Sciences.

Interdepartmental Biology Programs

Director of Biology Programs: LINDA R. MAXSON
Correspondence and Information: Biology Programs, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

Graduate Degree Programs, Admission. Interdepartmental biology programs lead to the Ph.D. in cell biology, ecology, neural and behavioral biology, and plant physiology. Additionally, two master's programs (M.S. in Biology, and M.S. in the Teaching of Biological Sciences and General Science) are offered. Graduate Record Examination scores are required for all Ph.D. programs and for the M.S. in the Teaching of Biological Sciences and General Science. All applicants must also outline their educational objectives in a brief statement and submit three letters of recommendation.

Master of Science in the Teaching of Biological Sciences and General Science. This degree is intended for persons planning to enter the teaching profession or who presently are teaching biology or general science in junior high school, high school, or junior college. It is awarded upon the completion of a minimum of 8 units of advanced credit (outlined below) and certification. For admission to this program, students must have an admission average of at least 4.0 (A = 5.0), and Graduate Record Examination scores must be submitted.

Candidates for the Master of Science in the Teaching of Biological Sciences and General Science must earn 4 units in biological sciences, 2 units in education (see page 104), and 2 units in electives. Electives may be in the biological sciences, education, or, in exceptional cases, other fields. A course in biological chemistry is strongly advised. Students who are preparing for high school teaching and who are not yet certified must fulfill state certification requirements.

Master of Science in Biology. This program is designed by the student in consultation with an appropriate adviser. While general training in biology is encouraged, concentration in any area of biology is possible as well; however, students intending to concentrate in entomology, microbiology, animal physiology, biophysics, or plant biology should apply directly to the appropriate School of Life Sciences departmental graduate program. Admission requires a grade-point average of at least 4.0. Although no specific undergraduate courses are required for admission to this curriculum, a minimum of a year of physics with laboratory, a course in organic chemistry with laboratory, and a semester of calculus must be completed before a degree is granted. Of the 8 units required for the degree, at least 3 units must be taken in 400-level courses. A thesis is not required, but a research report covering at least 1 unit of individual problem work must be completed. A comprehensive examination may be required of all candidates.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in several interdepartmental areas: cell biology, ecology, neural and behavioral biology, and plant physiology. Entrance requirements, in addition to those listed for the Master of Science degree, include background training in general biology, physics, biochemistry, and calculus; deficiencies in these areas may be remedied during the first year of graduate study. Programs are designed in consultation with advisers to suit individual needs. Students who have been accepted for one of these programs may select as a major adviser a faculty member from any department in the School of Life Sciences or an appropriate member of a cooperating department. Additional information may be obtained from the School of Life Sciences. Descriptions of these area doctoral programs are given below.

Anatomical Sciences. See page 138.

Cell and Molecular Biology. This program emphasizes molecular mechanisms and is therefore addressed to students who have acquired or wish to acquire a strong background in chemistry. Areas of research open to students in this program include cytochemistry, biochemistry of subcellular systems, cellular differentiation, gene expression, intercellular regulation of meiosis and mitosis, circadian rhythms, cellular genetics, and virology.

Ecology. The ecology program is an interdepartmental approach to the study of the basic interrelationships between organisms and their physical and biological environment, and the structure and the function of ecosystems. Areas of specialization include basic and applied aspects of physiological, population, community, systems, and evolutionary ecology.

Ecology, Ethology, and Evolution. See page 138.

Genetics and Development. See page 140.

Neural and Behavioral Biology. This multidisciplinary program includes staff members from physiology; psychology; biochemistry; biophysics; anatomical sciences; entomology; ecology, ethology, and evolution; engineering; genetics and development; veterinary medicine; and basic medical sciences. The program is heavily research oriented with individually tailored plans of study designed to provide students with a strong background in the collective disciplines of neurobiology and in the students' specific areas of concentration. Research areas include neuroanatomy, neurochemistry, neuroendocrinology, neurobiological development and genetics, neurophysiology, neuroethology, and physiological psychology.

Plant Physiology. Plant physiology, an interdepartmental area of specialization, is staffed by plant physiologists from six plant science departments: agronomy, forestry, horticulture, physiology and biophysics, plant biology, and plant pathology. Thesis

research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen metabolism, hormones and nucleic acids, herbicide action, molecular biology of chloroplasts, water relations, environmental physiology, and disease physiology. In addition to plant physiology, students are required to complete courses in biochemistry and physical chemistry.

Anatomical Sciences

Acting Head of the Department: D. L. STOCUM
Correspondence and Information: Department of Anatomical Sciences, University of Illinois at Urbana-Champaign, 190 Basic Medical Sciences, 506 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. BARR, W. T. GREENOUGH, C. R. LEESON, D. L. STOCUM
Associate Professors: J. A. CAMERON, M. A. HOLZWARTH, L. L. KLEPINGER, A. KOKKO-CUNNINGHAM, J. A. WEYHENMEYER
Assistant Professors: J. E. MITTENTHAL, J. M. THOMPSON

Graduate Degree Program. The Department of Anatomical Sciences administers a graduate degree program as an option in biology. Anatomical sciences are concerned with the structural aspects of organisms and comprise: (1) gross anatomy, which emphasizes the macroscopic organization and integrated function of organisms; (2) microscopic anatomy, which deals with the structure and function of cells, tissues, and organs; (3) functional neuroanatomy, which is concerned with the structure and function of the nervous system; and (4) developmental anatomy, which encompasses morphogenesis, cell differentiation, and growth.

Admission. Applications are evaluated on an individual basis. The formal entrance requirement is a minimum grade-point average of 4.0 (A = 5.0). Important factors in the evaluation of applications are general academic performance, background in the physical sciences, and letters of recommendation from college professors. Applicants are expected to have had chemistry through organic, general physics, mathematics through calculus, biology including some genetics, general physiology, and some morphology and/or embryology. The prospective student must submit results of the Graduate Record Examination. Although applications from qualified students are considered throughout the year, deadline for submission of applications is July 1.

Doctor of Philosophy in Biology: Anatomical Sciences Area of Specialization. The program leads to the Doctor of Philosophy degree and stresses the application of biological structure in the analysis and interpretation of biological processes. In order to successfully complete the graduate program in anatomical sciences, the student must fulfill requirements in the following categories: course work, qualifying examination, preliminary oral examination, defense of the thesis, teaching, and departmental seminars. A brochure providing additional information about the program is available upon request.

Financial Aid. Financial aid is available to a limited number of qualified applicants in the form of: (1) University Fellowships and tuition and fee waivers, awarded on a competitive basis; (2) teaching assistantships, awarded by the department; and (3) research assistantships, allotted by individual faculty members with research funds available for this purpose.

Ecology, Ethology, and Evolution

Head of the Department: G. O. BATZLI
Correspondence and Information: Department of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign, 515 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G. O. Batzli, R. W. Burkhardt, T. H. Frazzetta, L. L. Getz, A. W. Ghent, J. Hirsch, L. M. Page, S. L. Portnoy, M. Salmon, G. C. Sanderson, M. F. Willson

Associate Professors: N. Burley, F. F. Herricks, G. H. Kieffer, R. P. Larkin, M. R. Lee, M. R. Lynch, L. R. Maxson, D. P. Philipp, D. C. Sweeney, T. Uzzell, M. J. Wiley

Assistant Professor: S. K. Robinson

Graduate Degree Programs. The Department of Ecology, Ethology, and Evolution administers graduate degree programs as options in biology. Areas of training include physiological, population, community, and evolutionary ecology; ethology, physiological mechanisms of behavior, and behavior-genetics; evolutionary biology, population genetics, karyotypic and molecular analysis, functional anatomy, and systematics; quantitative analysis of genetic and ecological systems; and resource management.

Admission. Acceptance for graduate study in ecology, ethology, and evolution is based on the applicant's research potential and academic achievement. An undergraduate degree in the life sciences is the usual preparation, but students majoring in mathematics, computer science, or the physical and social sciences are also considered. Courses required for admission are inorganic and organic chemistry, biochemistry, and a year of physics and mathematics through calculus. Students lacking one or more of these courses may be admitted with the provision that such deficiencies be completed in addition to the normal graduate course load. A grade-point average of at least 4.0 (A = 5.0) for the last 60 hours of undergraduate work in addition to any graduate study is mandatory, and high scores on the Graduate Record Examination are necessary. Considerable emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. With approval of the M.S. biology committee, students in ecology, ethology, and evolution may pursue an M.S. degree in biology under the supervision of a departmental adviser (see Master of Science in Biology, page 137).

Doctor of Philosophy in Biology: Ecology, Ethology, and Evolution Area of Specialization. Candidates for the Ph.D. degree must demonstrate excellence in the three departmental areas and, in consultation with an adviser and doctoral committee, plan and carry out original thesis research with distinction. A qualifying examination covering general knowledge is given early in the student's program, and a preliminary examination assessing the feasibility and significance of the thesis research is given shortly after the student begins to concentrate on thesis work. Courses in both statistics and computer science are required and proficiency in one or more foreign languages may be required depending on the field of research. Additional requirements are individually prescribed by the adviser and doctoral committee. A final examination, in which the student defends the thesis, and a presentation of the thesis at a departmental seminar complete the program.

Entomology

Head of the Department: Stanley Friedman

Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: S. Friedman, A. W. Ghent, W. R. Horsfall, M. Kogan, W. E. LaBerge, J. R. Larsen, R. L. Metcalf, D. S. Seigler, R. B. Selander, J. G. Sternburg, G. P. Waldbauer, J. H. Willis

Associate Professors: M. R. Berenbaum, S. Berlocher, F. Delcomyn, M. E. Irwin, E. G. MacLeod, J. V. Maddox, W. G. Ruesink

Graduate Degree Programs. The Department of Entomology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees.

Admission. The Graduate College admission requirements apply. Previous training in entomology is not necessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Master of Science. A candidate for the M.S. degree is expected to become knowledgeable in entomology through course and field work and to complete a research thesis in an area of interest arrived at in consultation with an adviser. The grade-point average required for degree certification is 4.0 (A = 5.0).

Doctor of Philosophy. A candidate for the Ph.D. degree must master the general areas of entomology (ecology, control, morphology, physiology, and taxonomy) and demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research, ordinarily German or Russian, is also required. The grade-point average required for degree certification is 4.0.

Financial Aid. Awards for graduate students are available, including teaching and research assistantships. In addition, various types of fellowships, traineeships, and tuition and service fee waivers are offered by the Graduate College and the School of Life Sciences. A single application to the department is sufficient for consideration for all awards currently available.

Genetics and Development

Head of the Department: R. W. Tuveson

Correspondence and Information: Department of Genetics and Development, University of Illinois at Urbana-Champaign, 515 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. R. Maxson, D. L. Nanney, R. B. Selander, D. M. Steffensen, D. L. Stocum, R. W. Tuveson, G. S. Whitt, J. H. Willis, C. R. Woese

Associate Professors: E. H. Brown, W. L. Daniel, R. Davenport, E. G. MacLeod, R. MacLeod, M. J. Plewa, M. L. Sargent

Graduate Degree Program. The Department of Genetics and Development offers graduate study leading to the Doctor of Philosophy in Biology degree in the genetics and development option. Major areas of research interest include molecular, cellular, developmental, and evolutionary genetics; pattern formation in development; morphogenesis and regeneration; immunology; and molecular evolution. Biological systems are studied at many levels of integration and with a wide variety of organisms. Students seeking a master's degree are directed to the Master of Science in Biology program offered by the School of Life Sciences. Financial support is provided to qualified students by the Department of Genetics and Development in the form of teaching assistantships, research assistantships, or fellowships. A brochure providing detailed information about the doctoral program is available from the department office upon request.

Admission. Applicants are evaluated on the basis of their educational background; grade-point average, which must be at least 4.0 (A = 5.0); Graduate Record Examination scores, which should be above the 60th percentile; research interests and experience; and letters of recommendation. Applicants should have completed college-level courses in calculus, inorganic and organic chemistry, biochemistry, physics, statistics, and a foreign language, and should have broad training in the biological sciences. Applicants who have received an M.S. degree must meet these same requirements and must have at least a 4.0 (A = 5.0) grade-point average for nonthesis

courses which were applied to the M.S. degree. An M.S. degree is not required for admission.

Doctor of Philosophy in Biology: Genetics and Development Area of Specialization. Students plan a suitable program of study in consultation with an advising committee during the first year and then plan a thesis research program in consultation with a research adviser and a doctoral committee. The training program must include at least 6 units of formal course work pertaining to the student's area of interest with at least one course each in the areas of cell biology, genetics, evolution, and developmental biology. Participation in appropriate seminar courses for at least two semesters and reading proficiency in a foreign language (usually French, German, or Russian) are also required. A written and oral qualifying examination, assessing the student's breadth of training and ability to integrate and communicate knowledge, is taken early in the second year. An oral preliminary examination, assessing competence in a specialty, the feasibility of the thesis research, and the student's ability to conduct independent research, is taken during the second or third year. The student defends the thesis at an oral final examination.

Microbiology

Head of the Department: JORDAN KONISKY
Correspondence and Information: Department of Microbiology, University of Illinois at Urbana-Champaign, 131 Burrill Hall, 407 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. P. BRYANT, J. E. CRONAN, S. KAPLAN, J. KONISKY, R. C. MEYER, M. E. REICHMANN, D. C. SAVAGE, E. W. VOSS, C. R. WOESE, R. S. WOLFE
Associate Professors: J. F. GARDNER, S. J. KAUFMAN, A. A. SALYERS, P. K. Y. WONG
Assistant Professor: S. R. MALOY, J. F. SCOTT

Graduate Degree Programs. The Department of Microbiology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. For both degrees, the program provides a strong basic background in microbiology, biochemistry, molecular genetics, and molecular biology. Students completing the program are qualified for positions in academic, industrial, or government laboratories and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Major areas of research interest are: the genetics and molecular biology of DNA replication, gene expression and regulation in prokaryotes and eukaryotes, photosynthesis, viral function and development including virus host-cell interactions, membrane biogenesis including protein insertion, fatty acid and phospholipid synthesis, bacterial pathogenesis and bacterial-host interactions, immunoglobulin chemistry, structure and expression, anaerobic microbiology including rumen microbiology, the biochemistry of methane formation and microbial physiology, and the cell biology and biochemistry of development and differentiation of muscle tissue and photosynthetic organelles.

Admission. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through organic chemistry and biochemistry, 15 credit hours of physical or biological sciences, and mathematics through calculus.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees, following their choice of a faculty mentor. Study programs are flexible and are dependent upon the experience, interests, and goals of each student. Experience in teaching is considered to be a vital part of the graduate program and is required as a part of the academic work of all M.S. and Ph.D. degree candidates in this department.

Physiology and Biophysics

Head of the Department: D. E. Buetow

Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, 407 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. M. Bahr, L. Barr, D. E. Buetow, A. R. Crofts, P. B. Debrunner, A. L. DeVries, E. Donchin, H. S. Ducoff, F. Dunn, T. G. Ebrey, H. Frauenfelder, R. B. Gennis, Govindjee, W. T. Greenough, J. E. Heath, S. I. Helman, B. S. Katzenellenbogen, J. R. Larsen, R. A. Nelson, C. L. Prosser, V. D. Ramirez, E. Satinoff, I. A. Siegel, W. W. Sleator, H. M. Swartz, A. R. Twardock, G. Weber, J. S. Willis, J. E. Zehr

Associate Professors: P. M. Best, M. J. Dawson, F. Delcomyn, A. S. Feng, R. Gillette, E. G. Jakobsson, B. W. Kemper, A. Kokko-Cunningham, B. Oakley, E. J. Roy, O. D. Sherwood, D. C. Sweeney, C. A. Wraight

Assistant Professors: G. N. Phillips, T. G. Waldrop

PHYSIOLOGY

Admission and Financial Aid. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a strong undergraduate training in science. The Graduate College admission requirements apply. Most students admitted have had a grade-point average between an A and B and letters of recommendation that indicate ability to perform graduate work. Fellowships and teaching or research assistantships are available for qualified students. Applicants are strongly urged to submit scores of the Graduate Record Examination (GRE) or similar examinations.

Master of Science. A master's degree requires 8 or more units of graduate work drawn from the offerings of this and other departments. Each student must submit, and pass an oral examination on, a report based on original research. The examination is conducted by a faculty qualifying committee.

Doctor of Philosophy. Every candidate for the Ph.D. degree is required to take three core lecture courses and four laboratory courses, the latter of 5 weeks duration each, in order to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology. Each student also is expected to acquire a high degree of expertise in an area of specialization; to develop proficiency in biochemistry, physical chemistry, and statistics; and have a reading knowledge of one foreign language (usually French or German). The student should begin research as soon as possible after admission. To qualify to continue in the Ph.D. program, students must submit, and pass an oral examination on, a report describing their initial research. The examination is conducted by a faculty qualifying committee usually during the fourth semester after admission to the graduate program.

The preliminary examination is taken after completion of at least 16 units of graduate course work, after completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. Defense of a thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the branches of physiology constitutes the final examination.

BIOPHYSICS

Admission and Financial Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical sciences to the solution of biological problems. The curriculum is broadly based, and provides an adaptable approach for students entering with previous training in the physical sciences or for students with a background in biology and some experience in the physical sciences. Admission requirements are normally one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics

through calculus, but deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0 (A = 5.0). Fellowships, traineeships, and teaching or research assistantships are available for qualified students. Normally students are expected to gain at least one semester of teaching experience during their graduate careers.

Master of Science. To obtain the Master of Science degree, the student must complete at least 8 units in biophysics and related subjects, including 3 units at the 400 level, of which 2 units must be in biophysics courses (excluding individual topic courses, seminars, and research). A thesis or research paper in a specialized field is also required.

Doctor of Philosophy. A flexible approach is made to curriculum requirements, but an acceptable course program usually includes the following: (1) Physical sciences: mathematics through differential equations, physics and physical chemistry including thermodynamics and elementary quantum mechanics, and biochemistry with laboratory. (2) Biophysics: satisfactory completion of 2½ units of 400-level biophysics courses (excluding individual topic courses, seminars, and research). Other subjects may be taken with the approval of faculty. (3) Students are encouraged to gain research experience as soon as practicable after admission; the Ph.D. degree is a research degree, and the program is designed with a major emphasis on individual research.

A pass-fail qualifying examination is usually taken during or before the fourth semester. After the student has formulated a definite research problem, he takes the preliminary examination in which this topic is presented to a faculty committee. The committee also will question the candidate on his general research area. The requirement of one foreign language should be satisfied prior to the preliminary examination. Finally, a thesis based on original work and demonstrating a thorough knowledge of theory and techniques in one of the areas of biophysics must be defended at the final examination.

Plant Biology

Head of the Department: TOM L. PHILLIPS

Correspondence and Information: Associate Head, Department of Plant Biology, University of Illinois at Urbana-Champaign, 289 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. B. BUETOW, Z. B. CAROTHERS, R. E. CRANG, J. M. J. DE WET, D. B. DICKINSON, GOVINDJEE, C. H. GRUNWALD, L. R. HOFFMAN, J. R. LAUGHNAN, W. L. OGREN, T. L. PHILLIPS, D. S. SEIGLER, R. W. TUVESON

Associate Professors: C. K. AUGSPURGER, J. L. CRANE, D. R. ORT, M. L. SARGENT, C. A. SHEARER, C. A WRAIGHT

Assistant Professors: R. W. CARLSON, J. M. CHEESEMAN, A. G. JONES, D. L. NICKRENT, E. M. OROZCO, M. A. SCHULER, C. J. WHITMARSH, R. E. ZIELINSKI

Affiliates: J. A. D. PARRISH, P. G. RISSER, K. R. ROBERTSON

Graduate Degree Programs. The Department of Plant Biology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. It also participates in interdepartmental study programs leading to doctoral degrees in cell biology, ecology, and plant physiology.

Areas of specialization available within the department include: anatomy, bioenergetics, biophysics, bryology, circadian rhythms, development, ecology, genetics, molecular biology, mycology, paleobotany, paleoecology, photosynthesis, phycology, physiology, phytochemistry, population biology, systematics, and ultrastructure. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization. A knowledge of the principles

of ecology, genetics/molecular biology, morphology, physiology, and systematics is strongly recommended.

A brochure, providing additional information about the department, its facilities, and the research interests of its faculty, is available from the associate head upon request.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required. Graduate College admission requirements also apply.

Master of Science. Candidates for the M.S. degree are expected to fulfill the requirements of the Graduate College and to broaden and deepen their training in a program of course work and research agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser. The master's degree program is normally completed within two years.

Doctor of Philosophy. Candidates for the Ph.D. are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser. The department requires a minimum of one foreign language to be completed prior to the preliminary examination, usually chosen from French, German, Latin, Russian, or Spanish. More than one foreign language may be required at the option of the adviser.

An evaluation of each student's academic progress will be made at the end of his or her second year of graduate study, and departmental approval must be obtained at this juncture to continue in a graduate degree program.

Financial Aid. Teaching assistantships, fellowships, and research assistantships are available for qualified students. A student who is awarded a fellowship may apply to have his or her stipend augmented with a part-time teaching or research assistantship.

LINGUISTICS

(Including Arabic, Modern and Classical Hebrew, Hindi, Persian, and African Languages)

Chairperson of the Department: CHIN-W. KIM

Correspondence and Information: Department of Linguistics, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E. H. ANTONSEN, K. O. ASTON, D. E. BARON, W. C. BLAYLOCK, G. M. BROWNE, C. C. CHENG, C. L. DAWSON, P. A. GAENG, G. M. GREEN, B. B. KACHRU, Y. KACHRU, M. J. KENSTOWICZ, C.-W. KIM, C. W. KISSEBERTH, F. K. LEHMAN, H. MACLAY, S. MAKINO, J. W. MARCHAND, M. SALTARELLI, M. SAVILLE-TROIKE, B. A. SHERWOOD, G. L. TIKKU, R. C. TROIKE, W. R. ZEMLIN, L. ZGUSTA

Associate Professors: E. G. BOKAMBA, L. F. BOUTON, P. COLE, J. R. COWAN, W. B. DICKERSON, R. DUNATOV, F. Y. GLADNEY, H. H. HOCK, F. M. JENKINS, J. L. MORGAN, D. WANNER

Assistant Professor: M. MACK

Professor Emeritus: H. R. KAHANE

Graduate Degree Programs. The Department of Linguistics offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees. Work toward these degrees is divided into three areas. General linguistics includes historical linguistics, phonology, semantics, and syntax. Applied linguistics covers artificial intelligence, cognitive science, computational linguistics, experimental phonetics, language acquisition, lexicography, psycholinguistics, sociolinguistics, and stylistics. Area linguistics may be undertaken with a concentration, for example, in African, Romance, Semitic, and South, West, or East Asian linguistics.

Admission. Undergraduate preparation for admission to the master's program in linguistics should include the equivalent of Linguistics 300, 301, and 302; at least three years of foreign language experience (familiarity with two foreign languages is recommended); and a broad background in the humanities, social sciences, and mathematics. The Graduate College admission requirements apply.

Master of Arts in General or Applied Linguistics. The aim of the master's program is to instruct students in the important areas of linguistics and the methods of linguistic analysis. Candidates for this degree must earn 8 units, including courses in syntax, phonology, history of linguistics, and an area of specialization. Those concentrating on the general program are required to take Linguistics 340, 401, 402, 411, 441, and 442. The applied program requires Linguistics 305, 325, 340, 350, 401, and 402. In addition, the student must have proficiency in one language (other than his or her native tongue) in which there exists a significant body of linguistic literature and must pass the comprehensive qualifying examination. Admission to this examination is contingent upon satisfying the language requirement. For a terminal master's degree without the qualifying examination, a master's essay must be written in addition to the 8 units.

Doctor of Philosophy in General or Applied Linguistics. Admission to candidacy for the Ph.D. normally requires a grade-point average of 4.5 or better for all graduate work in linguistics and distinction in passing the comprehensive qualifying examination. In deciding whether a student will be admitted to the Ph.D. program, the examination and student evaluation committee takes into consideration the student's overall performance in the department, potential for linguistic research, and performance on the qualifying examination.

Candidates for this degree must complete at least 24 units of graduate work or 16 units beyond the master's degree. The minimum 24 units must include the course requirements listed above for the master's degree (or their equivalent), advanced courses as required for the area of specialization, and 8 units of thesis research. Candidates must also demonstrate proficiency in a second language other than English. However, this second language requirement is made flexible depending on the research interest of the student. The candidate is required to take the preliminary examinations (written and oral) after completion of 8 units beyond the master's level. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to 2 units of credit granted by the host university under this program may be transferred. Students of descriptive linguistics also are urged to establish a vested interest and a firm basic foundation in some particular language family as early as possible in their graduate career. Linguistically oriented courses in related departments may be counted toward the major if approved by the adviser. The head of the department acts as general adviser to each student until the selection of the field of concentration, at which time the student comes under the guidance of an adviser in his or her special area.

MATERIALS SCIENCE

The Materials Research Laboratory supports research and training of graduate students in the materials sciences. However, the laboratory is not itself a degree-granting unit. A student interested in study in materials science should apply directly to one of the departments which cooperates in research at the laboratory. These are the Departments of Ceramic Engineering, Chemical Engineering, Chemistry, Electrical and Computer Engineering, Geology, Metallurgy and Mining Engineering, and Physics.

MATHEMATICS

Head of the Department: HEINI HALBERSTAM
Director of Graduate Studies: WILSON ZARING

Correspondence and Information: Director of Graduate Studies, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, 1409 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: F. R. Albrecht, J. R. Alexander, Jr., K. I. Appel, R. B. Ash, S. B. Bank, R. G. Bartle, P. T. Bateman, H. E. Benzinger, Jr., I. D. Berg, E. R. Berkson, B. C. Berndt, R. L. Bishop, J. Bourgain, P. G. Braunfeld, D. L. Burkholder, R. W. Carroll, K. T. Chen, R. F. Craggs, E. C. Dade, R. B. Davis, H. G. Diamond, E. G. Evans, Jr., R. M. Fossum, G. K. Francis, C. W. Gear, S. I. Goldberg, J. W. Gray, P. A. Griffith, W. R. G. Haken, H. Halberstam, M. E. Hamstrom, S. P. Han, L. L. Helms, C. W. Henson, G. J. Janusz, R. P. Jerrard, C. G. Jockusch, F. W. Kamber, R. P. Kaufman, F. B. Knight, R. G. Langebartel, P. A. Loeb, H. P. Lotz, L. R. McCulloh, L. McLinden, J. B. Miles, C. J. Moreno, D. E. Muller, H. A. Osborn, J. I. Palmore, E. T. Parker, N. T. Peck, A. L. Peressini, W. V. Philipp, H. A. Porta, R. R. Rao, I. Reiner, D. J. S. Robinson, J. J. Rotman, L. A. Rubel, P. E. Schupp, K. B. Stolarsky, W. F. Stout, M. Suzuki, G. Takeuti, T. W. Ting, P. M. Tondeur, J. J. Uhl, Jr., S. V. Ullom, J. H. Walter, P. M. Weichsel

Associate Professors: S. B. Alexander, A. Babakhanian, J. W. Brown, J. P. D'Angelo, L. L. Dornhoff, A. C. Fauntleroy, W. A. Ferguson, D. R. Grayson, D. Monrad, R. G. Muncaster, B. A. Reznick, D. R. Sherbert, L. van den Dries, E. C. Weinberg, D. B. West, J. E. Wetzel, J. M. Wu, W. M. Zaring

Assistant Professors: P. Aviles, N. Papageogiou, E. G. Portnoy

Graduate Degree Programs. The department offers graduate study leading to the Master of Science (or of Arts) and the Doctor of Philosophy in Mathematics, the Master of Science in Applied Mathematics, and the Master of Science in the Teaching of Mathematics. An advanced certificate in community college mathematics teaching is also available.

Admission. The Graduate College admission requirements apply. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics. Students whose undergraduate training in mathematics is deficient may be admitted with deficiencies to be removed during the first year of graduate study.

Master's Degree Programs. The master's degree programs can be completed in one year of full-time study by students entering without deficiencies. However, most students find it necessary to devote at least one additional summer or semester. Students entering with deficiencies may require up to two years to complete the degree. There are no thesis or language requirements, and no comprehensive examination is required.

The master's degree in mathematics requires a total of 8 units of study, of which 3 must be at the 400 level, and 2 of the 3 must be in mathematics. The master's degree in applied mathematics requires a total of 8 units of study of which 3 must be at the 400 level. Additional course and sequence requirements can be satisfied through study in one of four different programs: (1) the computation or optimization program, (2) the science applications program, (3) the operations research program, or (4) the actuarial science program.

The master's in the teaching of mathematics requires a total of 8 units of study, of which 4 must be in mathematics and 2 must be in education.

The advanced certificate in community college mathematics teaching is designed to be completed in two semesters following completion of a master's degree in mathematics. The program involves student teaching and specialized course work.

Doctoral Degree Programs. Students working toward a doctoral degree usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses in abstract and linear algebra and real and complex analysis), pass the preliminary

examination (testing the content of three areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. A reading knowledge of two of the following languages is required: German, French, or Russian. Students whose native language is not English may count English as a foreign language. They are then required to establish a reading knowledge of one language from German, French, or Russian, excluding their native language.

Financial Aid. Financial aid is available in the form of teaching assistantships, fellowships, and tuition and service fee waivers. The deadline for submission of complete fellowship applications is February 15. The initial deadline for submission of complete assistantship applications is also February 15, but applications are considered after that as long as positions remain available.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: B. T. Chao
Associate Heads of the Department: A. L. Addy and R. O. Buckius
Graduate Policy Committee Chairperson: A. L. Addy
Correspondence and Information: Mrs. Celia G. Snyder, Graduate Programs Coordinator, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, 140 Mechanical Engineering Building, 1206 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A. L. Addy, R. O. Buckius, B. T. Chao, J. C. Chato, M. M. Chen, W. L. Chow, A. M. Clausing, J. M. Crowley, C. Cusano, R. E. DeVor, J. E. Greene, B. G. Jones, H. H. Korst, H. Krier, F. A. Leckie, J. S. Liebman, D. F. Socie, S. L. Soo, W. F. Stoecker, J. J. Stukel, R. A. White
Associate Professors: C. W. Bullard, M. I. Dessouky, W. E. Dunn, J. C. Dutton, S. G. Kapoor, R. E. Klein, C. S. Larson, D. L. Marriott, J. Mazumder, N. R. Miller, D. H. Offner, C. O. Pedersen, R. E. Reid, L. D. Savage, S. C. Sorenson, C. L. Tucker
Assistant Professors: D. Assanis, J. Bentsman, S. J. Chen, R. R. Crawford, J. A. Dantzig, K. Lee, S. C. Lu, T. A. Newell, J. E. Peters, J. P. Renie, P. M. Sanderson, H. Sehitoglu, B. G. Thomas, N. S. Vlachos

Graduate Degree Programs. The Department of Mechanical and Industrial Engineering offers studies leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, and the Doctor of Philosophy in Mechanical Engineering. In mechanical engineering, a student may specialize in any of the core areas including thermodynamics, heat transfer, fluid dynamics, multiphase systems, combustion, internal combustion engines, thermal systems including environmental control in buildings, environmental engineering and air pollution controls, solar energy, kinematics and dynamics of machinery, friction, lubrication and wear, control systems, computer-aided design, materials engineering and mechanical behavior of materials, materials processing including solidification, polymer processing and laser materials processing, and bioengineering. In industrial engineering a student may specialize in any of the several areas of manufacturing systems, operations research, and human factors, including production control and quality control, man-machine systems, facilities planning and design, computer-aided manufacturing, mathematical programming, simulation, project management, and production process design.

Admission. The requirements governing admission are as follows. The applicant must: (1) be a graduate of an institution awarding a baccalaureate degree equivalent to that granted by the University of Illinois at Urbana-Champaign; (2) be adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record; and (3) be recommended for admission by the Department

of Mechanical and Industrial Engineering. A minimum grade-point average of 4.25 (A = 5.0) for the last 60 hours of undergraduate study is required. On rare occasions, the department may recommend an applicant for admission with limited standing even if the admission grade-point average is below the required departmental minimum. The department does not require the Graduate Record Examination, nor does it have a language requirement. Based upon the previous preparation of the student, prerequisite courses may be specified by the adviser, but the credit may not be applied toward a degree. The department requires a minimum TOEFL score of 590.

Master of Science. A total of 8 units (including thesis credits) is required. A full-time student can complete this program in an academic year. For those students terminating their studies with the M.S. degree, a nonthesis option is available by departmental petition. Those not writing a thesis are required to complete a minimum of 9 units of credit. In such cases, the study program includes a unit of laboratory investigation since each student is required to show evidence of ability to do independent study.

Doctor of Philosophy. A master's thesis or equivalent is required of all applicants for Ph.D. study. Those students who enter with a master's degree and who have not written a thesis or the equivalent may be required to register in laboratory investigations during their first semester of residence on the Urbana-Champaign campus for the purpose of demonstrating their ability to do independent research. Qualifying examinations are to be taken during the semester in which the ninth unit of graduate credit is earned, at the earliest, but no later than the first semester thereafter. A total of 16 units of course work beyond the B.S. degree is a minimum course requirement for the Ph.D. degree. The minimum total requirement for the Ph.D. degree is 24 units, including thesis research credit. In order to be considered for acceptance as a doctoral candidate, the student must prepare a thesis proposal and take an oral preliminary examination. If successful, the candidate completes the thesis work and takes a final oral examination.

MEDICAL SCHOLARS PROGRAM

The Medical Scholars Program at the Urbana-Champaign campus enables students to combine the study of medicine with graduate or professional study in a second field. The program seeks to produce leaders in medicine and medical research uniquely qualified and motivated to address the compelling problems of health care and medical practice. The College of Medicine at Urbana-Champaign, one of four regional campuses of the University of Illinois College of Medicine, offers the program in cooperation with graduate departments and professional schools on the Urbana-Champaign campus.

Students are expected to earn two degrees — the M.D. and a graduate or professional degree. Applicants should be able to identify research interests and professional goals that demand the integration of medicine with a second field and that cannot be accomplished with one degree alone. To enter the Medical Scholars Program, applicants must meet the admissions requirements of, and be accepted by, both the University of Illinois College of Medicine and the Urbana-Champaign campus academic unit in which they wish to study. They apply to the Medical Scholars Program at the same time that they apply to medical school.

Students in the Medical Scholars Program are expected to fulfill all the requirements of both the College of Medicine and the second discipline. Faculty advisers from the medical school and from the appropriate Urbana-Champaign campus unit help students set up realistic long-term study plans which integrate the two fields.

At present, research-oriented programs of integrated study are available or being developed in the following academic units on the Urbana-Champaign campus:

Accountancy
Anatomical Sciences
Anthropology
Architecture
Biochemistry
Business Administration
Ceramic Engineering
Chemistry
Communications Research
Computer Science
Economics
Education
Electrical and Computer Engineering
Environmental Toxicology
Genetics and Development
Food Science
Health and Safety Studies
History
Law
Metallurgy and Mining Engineering
Microbiology
Neural and Behavioral Biology
Nuclear Engineering
Nutritional Sciences
Philosophy
Physical Education
Physics
Physiology and Biophysics
Political Science
Psychology
Social Work
Sociology
Speech Communication
Speech and Hearing Science
Veterinary Biosciences
Veterinary Pathobiology

Arrangements with graduate units not listed here may be worked out, wherever possible, upon request.

In addition to the Medical College Admissions Test (MCAT), required for admission to medical school, examination scores, such as GRE, GMAT, and LSAT, are required by some departments and professional schools; applicants must arrange to take such examinations and have the scores forwarded to the appropriate academic unit on the Urbana-Champaign campus as well as to the Medical Scholars Program office.

For further information, consult the Coordinator, Medical Scholars Program, College of Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

METALLURGY AND MINING ENGINEERING

Head of the Department: N. L. PETERSON

Correspondence and Information: Head of the Department, Department of Metallurgy and Mining Engineering, University of Illinois at Urbana-Champaign, 201 Metallurgy and Mining Building, 1304 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. J. ALTSTETTER, H. K. BIRNBAUM, A. J. deWITTE, G. EHRLICH, H. FRASER, P. H. GEIL, J. E. GREENE, F. V. LAWRENCE, M. METZGER, N. L. PETERSON, T. J. ROWLAND, J. THORNTON, C. M. WAYMAN, C. A. WERT

Associate Professors: H. CHEN, R. GAYLORD, J. M. RIGSBEE, R. P. WOOL

Assistant Professors: T. A. PARTHSARATHY, I. ROBERTSON

Professors Emeriti: P. A. BECK, R. W. BOHL

Graduate Degree Programs. The Department of Metallurgy and Mining Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Metallurgical Engineering. The faculty members have a widely varied background in engineering and science, and graduates go into a broad range of industrial, governmental, and university positions. Close association exists with staff members in other departments having programs in the properties of solids. Graduate courses and thesis work in polymers are available at both the M.S. and Ph.D. levels.

Admission. Graduate students in metallurgical or mining engineering may have undergraduate degrees in a number of disciplines. Graduates with degrees in metallurgy or mining engineering, as well as the many graduate students who come from other engineering or science disciplines, fit into the graduate programs easily.

Graduates of departments of mechanical engineering, physics, chemistry, and ceramics are represented among our student body.

Master of Science. A candidate for the Master of Science degree is required to have a minimum of 8 units of graduate work, including a thesis. If a petition to waive the thesis is granted, a minimum of 9 units of graduate work is required. A thesis is required of candidates who hold research assistantships.

Doctor of Philosophy. Students desiring to work for the Doctor of Philosophy degree are required to pass the departmental qualifying examination. This oral examination must be taken no later than the end of the first semester after receiving the Master of Science degree from this department or after completing an equivalent amount of graduate work. The minor requirement of the department for the Doctor of Philosophy degree may be satisfied by taking courses in fields such as ceramics, chemistry, geology, mathematics, theoretical and applied mechanics, nuclear engineering, and physics. Although reading knowledge of a foreign language is helpful, there is no formal requirement.

MUSIC

(Including Music Education and Musicology)

Director of the School: ROBERT E. BAYS

Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, 2136 Music Building, 1114 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. BAYS, H. BRÜN, R. COLWELL, E. DALHEIM, K. DRAKE, B. EDLEFSEN, T. FREDRICKSON, R. GRAY, L. GUSHEE, J. HAMILTON, W. HEILES, J. HILL, I. HOBSON, J. KEENE, H. KELLMAN, C. LEONHARD, J. LYKE, S. MARTIRANO, J. MELBY, B. NETTL, G. PERICH, D. PETERS, M. POWELL, A. RINGER, J. SHAPIRO, T. SIWE, N. TEMPERLEY, R. THOMAS, P. VERMEL, W. WARFIELD, T. WISNIEWSKI, M. ZIMMERMAN, P. ZONN

Associate Professors: C. ALWES, J. BEAUCHAMP, R. HEDLUND, H. KLUG, D. KOHUT, S. TIPEI, H. VON GUNDEN, T. WARD, S. WYATT

Assistant Professors: C. CAPWELL, D. GRAYSON, D. LIPTAK, D. STIGBERG, M. TUNNELL

Graduate Degree Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education. Complete details of these programs may be found in the school's brochure on graduate study in music.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the M.Mus. degree are musicology, music theory, composition, performance and literature (piano, organ, voice, orchestral instruments), choral music, instrumental conducting, vocal accompanying and coaching, and group piano pedagogy.

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution (students holding other degrees may be admitted but will be expected to make up any deficiencies). Those majoring in musicology are generally expected to have a minimum grade-point average of 4.25 (A = 5.0). Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings. Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each

at the college level or two years at the high school level of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students otherwise admissible may satisfy any language deficiencies concurrently with graduate studies.

Degree Requirements. Candidates for the M.Mus. degree in theory-composition and in performance and literature must earn at least 8 units, including 2 units at the 400 level in their major field and 1 unit in problems and methods. Candidates in performance and literature must earn 2 units in the music literature course in their major applied area. Candidates in musicology must earn 2 units in introduction to musicology and 2 units in the seminar in musicology. Electives in music theory, history, and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate adviser. A graduate recital is required of all candidates in performance and literature. Candidates in musicology and theory must write a thesis, for which 2 units of credit are given. Candidates in composition must present a portfolio of their works for approval by the composition faculty.

Doctor of Musical Arts. The fields of specialization for the D.M.A. degree are composition, piano, organ, choral music, voice, violin, viola, cello, wind instruments, and percussion instruments.

Admission. Prerequisites for admission are: (1) The M.Mus. degree from the University of Illinois at Urbana-Champaign, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review, and candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble performance and/or score reading. (4) The successful completion of approximately 32 semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of 6 hours in history and 6 hours in literature and philosophy; candidates in voice must have fulfilled all foreign language requirements considered prerequisites for the M.Mus. degree.

Degree Requirements. Candidates must earn a minimum of 16 units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of 3 units in the major field of specialization, 2 units in advanced music literature courses, and 2 units in a minor field. A preliminary examination is taken once all course work is completed.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition and of performance and literature, 6 units are devoted to a special doctoral project. Composers must produce a large-scale original score. Performers must demonstrate comprehensive repertory study in the form of two solo recitals or one solo recital and two of the following options: a concerto; a major operatic or oratorio role; a chamber music program; a lecture-recital; or the preparation of and, when appropriate, conducting of a concert by an instrumental or vocal ensemble. In addition, both fields have a research requirement that serves in lieu of a thesis. In the field of choral music, 1 unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory, and 4 units are devoted to the writing of a thesis.

Doctor of Philosophy in Musicology. The Ph.D. in musicology is intended for those whose interests lie in research in the history of music, systematic musicology, or ethnomusicology.

Admission. Prerequisites for admission are: (1) The M.Mus. degree in musicology from

the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution. (2) A minimum of 32 semester hours in the liberal arts and sciences, normally including general history, philosophy, and literature.

Degree Requirements. A minimum of 16 units must be earned beyond the requirements for the master's degree, including at least 2 units in the seminar in musicology. Although no formal outside minor is required, students are expected to take courses in fields outside music that are appropriate to the proposed area of thesis research. A preliminary examination is taken after all course work is completed.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Eight of the total of 16 units are normally devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 4.0. Candidates for this degree must earn a minimum of 4 units in music courses, 2 units in education courses, and 2 units of electives. One of the 4 units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in their major performing medium during the registration period of their first term in residence. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. During the student's first registration period, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of 8 units beyond the master's degree is required, including 1 unit in music education courses and 1 unit in educational psychology.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music, music education, or a related academic discipline acceptable to the Graduate Committee for Music Education. Admission is determined by examinations in music history, music theory, music education, and applied music; personal interviews; records of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies test should accompany his or her application for admission.

Program. At least 16 units of work beyond the master's degree are required, including 6 units in music courses and 6 units in education courses. No more than 2 units of credit in applied music may be counted toward the degree. A thesis is required. It may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled by full-time study in two consecutive semesters or in one semester, a contiguous summer session, and one additional summer session.

Financial Aid. Fellowships, teaching and research assistantships, and tuition and service fee waivers are awarded on a one-year basis with continuation dependent upon success in the program. Specific information on application procedures is available from the Graduate Office, School of Music.

NUCLEAR ENGINEERING

Chairperson of the Program: GEORGE H. MILEY
Associate Chairperson: BARCLAY G. JONES
Correspondence and Information: Nuclear Engineering Program, University of Illinois at Urbana-Champaign, 214 Nuclear Engineering Laboratory, 103 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. A. AXFORD, A. B. CHILTON, J. J. DORNING, D. F. HANG, P. K. HOPKE, B. G. JONES, K. KIM, G. H. MILEY, C. E. SINGER, R. J. TURNBULL
Associate Professor: J. F. STUBBINS
Assistant Professors: W. H. CHOE, B. J. MICKLICH, A. M. OUGOUAG, M. RAGHEB, D. N. RUZIC, T. H. ZERGUINI

Graduate Degree Programs. The Nuclear Engineering Program offers work leading to the Master of Science and Doctor of Philosophy degrees.

Admission. Application for admission to the M.S. and Ph.D. programs is open to all graduates in engineering, mathematics, and the physical sciences with an average grade of B or better for the last 60 hours of undergraduate work and any graduate work completed. Prerequisites for admission include a course in ordinary differential equations plus one other mathematics course beyond calculus; a course in atomic physics; a course in electrical circuit theory; a course in thermodynamics; and a course in fluid mechanics or a course in continuum mechanics. A student may be admitted before completion of these prerequisites, but he or she must allow additional time for making up these deficiencies, and such make-ups will not count toward the number of units required for the degree. Transcripts will be reviewed prior to admission, and letters of recommendation are requested plus other information such as rank in class as an undergraduate. If necessary to limit enrollments, admission will be restricted to those judged most worthy. International students must show good proficiency in English or will be required to take courses in English as a second language.

Master of Science. The M.S. degree will usually take at least two semesters and a summer session to be completed. Eight units of graduate work are required, including an M.S. thesis. The curriculum requires courses covering the fundamentals of nuclear engineering, plus two or more courses in an area of concentration chosen by the student in consultation with his or her adviser. Such areas include: nuclear materials, fusion systems and plasma engineering, energy conversion, radiation protection engineering, reactor physics and radiation transport, reactor thermal analysis and design, and reactor safety and nuclear power economics. At least six of the courses taken must be in the nuclear engineering area.

Doctor of Philosophy. Course requirements for the Ph.D. degree include at least two more semesters beyond that required for the M.S. degree. After this period, one or more years may be needed for the doctoral research and thesis. Students desiring to work toward the Ph.D. degree must pass the qualifying examination to be admitted to doctoral study. After completion of the additional course work, the candidate must pass the preliminary doctoral examination. After completing the doctoral thesis, he or she must successfully defend it at the time of the final examination. A doctoral student would typically complete about twelve courses in nuclear engineering plus additional courses which support a specialized research area and provide background in mathematics and science. There is no foreign language requirement. Under exceptional circumstances, the doctoral research may be undertaken off campus.

Financial Aid. Fellowships and traineeships are generally available to support the best applicants. Other aid in the form of research assistantships and teaching assistantships is available for most, if not all, of the other graduate students. Other work of a professional nature can sometimes be found in the University or surrounding

community. If the number of students is more than the program can assist financially, the support is distributed according to academic merit.

Research Interests. Faculty research interests cover a wide range including, but not limited to, reactor physics and engineering, radiation measurements, fusion and plasmas, nuclear thermal-hydraulics, nuclear safety, nuclear bioengineering, radiation transport phenomena, nuclear materials, and neutron activation.

Facilities. The Illinois Advanced TRIGA reactor, situated on campus, is used for research and teaching in nuclear engineering. It is licensed to operate up to a steady-state power of 1.5 megawatts and to a transient–pulse peak power of 6000 megawatts. A unique facility is provided by a second low-power reactor separated from the main reactor by a graphite thermal column. Two neutron generators and a subcritical fission assembly are also available for research. A remote terminal link to the Cray computers at the Magnetic Fusion Energy Computing Center in Livermore, California, is located in the Fusion Studies Laboratory. Other fusion facilities include a dense plasma focus device and a cryogenic target manufacturing facility. The program also provides laboratories in heat transfer, fluid flow, and turbulence; radiation studies; direct energy conversion; plasma diagnostics; ultra-high-vacuum plasma facility for plasma-material interactions; and access to the National Center for Supercomputing Applications.

NUTRITIONAL SCIENCES

Director of the Division: JOHN A. MILNER

Correspondence and Information: Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, 451 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. H. BAKER, R. A. BOILEAU, J. H. CLARK, J. W. ERDMAN, JR., G. C. FAHEY, JR., P. V. JOHNSTON, B. P. KLEIN, B. L. LARSON, J. A. MILNER, S. P. MISTRY, R. A. NELSON, T. NISHIDA, E. G. PERKINS, M. F. PICCIANO, J. L. ROBINSON, A. J. SIEDLER, E. SLEATOR, W. J. VISEK, J. S. WILLIS

Associate Professors: P. J. BECHTEL, L. A. BIRCH, B. H. CHO, T. F. HATCH, A. K. HATFIELD, M. A. KHAN, D. K. LAYMAN, R. L. MAGIN, M. R. MURPHY, W. D. O'BRIEN, A. A. SALYERS, A. R. SHERMAN

Assistant Professors: R. BURR, G. CZARNECKI, R. H. DEERING, A. S. HASSAN, E. H. JEFFERY

Professors Emeriti: C. L. DAVIS, R. M. FORBES

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science and Doctor of Philosophy in Nutritional Sciences is offered. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes; animals, including man; nutritional biochemistry; and the chemistry of nutritional compounds and nutrition education. The program offers the opportunity for pursuing both the M.D. and Ph.D. degrees in the Medical Scholars Program.

Admission and Financial Aid. Applicants are expected to have an admission average of 4.0 (A = 5.0) for the last 60 hours of course work and basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of traineeships, assistantships, and fellowships. Applicants seeking August admission and expecting to be considered for financial assistance should file their applications before the preceding February 15th. Later applications will be considered depending on space and support available.

Master of Science. Requirements for the M.S. include courses in general biochemistry,

two courses in advanced nutrition, and one semester of seminar. Additional courses are available in such diverse subjects as human and animal nutrition, biochemistry, physiology, immunology, food science, education, anthropology, psychology, sociology, statistics, and/or agricultural economics. The M.S. degree may be taken with or without a thesis. The minimum course work requirements in units for the M.S. are 6 (plus at least 2 units of thesis credit) and 9 (nonthesis).

Doctor of Philosophy. In addition to maintaining a 4.0 average in formal course work, Ph.D. students are required to take a qualifying examination, an oral preliminary examination, and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to have competence in English. A minimum of 24 units of credit work beyond the baccalaureate degree is required.

PHILOSOPHY

Chairperson of the Department: R. L. SCHACHT

Correspondence and Information: Inquiries and correspondence should be directed as may be appropriate either to the Chairperson, the Director of Graduate Studies, or the Admissions and Financial Aid Committee, Department of Philosophy, University of Illinois at Urbana-Champaign, 105 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. E. CATON, R. L. SCHACHT, D. S. SHWAYDER, J. D. WALLACE, P. G. WINCH

Associate Professors: H. S. CHANDLER, T. G. MCCARTHY, A. MELNICK, R. D. MOHR, F. W. NEELY, W. R. SCHROEDER, S. J. WAGNER

Assistant Professors: D. A. BANTZ, M. W. BARON, P. L. MAHER, R. J. MCKIM, F. F. SCHMITT, R. G. WENGERT

Professors Emeriti: B. J. DIGGS, M. H. FISCH, A. R. TURQUETTE, F. L. WILL

Master of Arts. The normal program of graduate study in philosophy is directed toward the Ph.D., but students who wish to work only for the Master of Arts degree may also be admitted.

Admission. The Graduate College admission requirements apply. Applicants need not have done the course work in philosophy expected of applicants to the Ph.D. program, but must show some evidence of aptitude for graduate study in philosophy. Application materials required are the same as those for the Ph.D. program.

Program Description. Students in the A.M. program may qualify for the degree by earning at least 8 units of graduate credit with at least a 4.0 grade-point average (A = 5.0), 6 of which must be earned in regular courses; by satisfying a one-year residence requirement; by submitting a substantial essay; and by passing an oral examination on this essay. (There are no area, logic, or foreign language requirements for this degree.) An A.M. degree earned in this way is normally a terminal one. Students admitted to the A.M. program may, however, petition to the department for admission to the Ph.D. program either prior to or upon the completion of their qualification for the A.M. degree. (Students in the Ph.D. program are automatically awarded this degree when they satisfy the Ph.D. program preliminary examination requirement and are not required to submit the substantial essay or to pass the oral examination required for the terminal A.M. degree.)

Doctor of Philosophy.

Admission. The Graduate College admission requirements apply. In addition, applicants should have had a course in symbolic logic and general courses in the history of ancient and early modern philosophy. Students deficient in these areas may be admitted, but they are required to remedy their deficiencies by taking such courses in their first year. Applicants should also have done some course work in such central

areas of philosophical inquiry as ethics and the theory of knowledge. All applications for admission must be supported by three letters of recommendation from persons qualified to comment on the applicant's aptitude for graduate study in philosophy. All applicants are also urged to take the General Aptitude portion of the Graduate Record Examination and to submit their scores. They are further urged to submit a sample of their written work. Foreign applicants whose native language is not English should take the TOEFL examination and submit their scores. (A score of at least 600 is required for regular admission.)

Program Description. The Ph.D. program has three stages. (1) The first stage is completed when a student has earned 8 units of graduate credit or is deemed completed if the student has received a master's degree in philosophy elsewhere. (2) The second stage is completed when the student has earned 8 additional units (or, having received a master's degree previously, has earned and has been allowed transfer credit for a total of 16 units) and has satisfied the preliminary examination requirement, a foreign language requirement, and a logic requirement (see below). (3) The third stage is completed when the student has earned another 8 units of graduate credit (normally in seminars and thesis research) and has satisfied the thesis and doctoral oral examination requirements (see below). A minimum grade-point average of 4.0 (A = 5.0) is required for the Ph.D. Candidates must also satisfy the Graduate College residence requirement.

Candidates need not take work in a minor field outside of the department. In cases in which advanced study in philosophy would be enhanced by study in a related discipline, students may use such related course work to satisfy the credit requirements for the degree. Credit toward the satisfaction of these requirements in such cases is limited to 2 units. If a student wishes the work to count as an extradepartmental minor, the minimum number of units accepted is 2 and the maximum is 4.

The department offers four main fields of concentration: (1) The history of philosophy (including recent Anglo-American philosophy and Continental philosophy); (2) the theory of knowledge (including philosophy of science and philosophy of language); (3) metaphysics (including philosophy of mind and philosophy of religion); and (4) ethics and value theory (including social and political philosophy and aesthetics). Students may specialize in any of these areas but must demonstrate competence in all of them. To satisfy the preliminary examination requirement, they must demonstrate such competence either by passing written preliminary examinations in each of these areas or by taking certain courses and passing them with a minimum grade of at least B^+.

Before the department will certify that a student has satisfied this requirement, the student must also demonstrate either (a) a basic reading knowledge of two of the following languages: German, French, Greek, and Latin; or (b) high proficiency in one of these languages. (Substitution of another language requires the permission of the chairperson of the department.) In addition, the student must demonstrate competence in symbolic logic, either by passing an approved course in the subject or by passing a proficiency examination administered by the department.

There is no separate master's degree requirement for Ph.D. candidates. The A.M. degree in philosophy is automatically awarded to those who have not already earned this degree previously elsewhere when they satisfy the preliminary examination requirement.

Candidates for the Ph.D. who wish simultaneously to pursue advanced degrees in other disciplines (e.g., medicine or law) are permitted to do so. (For example, see the description elsewhere in this catalog of the Medical Scholars Program.) Those who wish to, however, are expected to satisfy the degree requirements specified above.

After satisfying the preliminary examination requirement, a candidate for the Ph.D. must submit an acceptable thesis (dissertation) and pass a final (oral) examination on the thesis. The acceptability of the thesis is judged, and the final examination is administered by the candidate's doctoral committee.

Financial Aid. Financial aid is available to many students in the form of fellowships, assistantships, and waivers of tuition and service fees. The maximum period for

which students may expect to receive financial aid is five years. (Exceptions may be made in some cases, e.g., when students are pursuing several advanced degrees simultaneously.) The department reviews the performance in the program of students receiving financial aid each year in order to determine whether their support should be continued. (Students receiving transfer credit for graduate work in philosophy done elsewhere lose one semester of eligibility for financial aid for each four units of transfer credit allowed.)

PHYSICAL EDUCATION

Head of the Department: KARL M. NEWELL

Correspondence and Information: Director, Graduate Studies Program Office, Department of Physical Education, University of Illinois at Urbana-Champaign, 225A Freer Hall, 906 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. ADRIAN, R. A. BOILEAU, A. T. CHESKA, J. W. LOY, G. LUESCHEN, R. MARTENS, B. H. MASSEY, D. O. MATTHEWS, K. M. NEWELL, G. C. ROBERTS, M. M. THOMPSON, R. G. WRIGHT

Associate Professors: D. GOULD, S. GREENDORFER, J. GROPPEL, J. E. MISNER, A. MORRIS, M. SLAUGHTER

Assistant Professors: G. W. BELL, L. CARLTON, H. DEUTSCH

Graduate Degree Programs. The Department of Physical Education offers graduate work leading to the degrees of Master of Science in the Teaching of Physical Education, Master of Science, and Doctor of Philosophy. Each of these is an individualized program of graduate study designed to develop outstanding educators, scholars, and researchers in physical education.

Master of Science in the Teaching of Physical Education. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, eligibility for teacher certification in the state of Illinois, acceptable scores on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for individuals who wish to advance their teaching competencies. Candidates for this degree must complete a minimum of 8 units, 4 of which must be in physical education and 2 in education courses. Three of the total units must be in 400-level courses. Of the 4 units in physical education, Physical Education 495 (Techniques of Research in Health, Physical Education, and Recreation) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. Information concerning the specific requirements of the 2 units in education may be obtained from the graduate studies office of the department. At least one-half of the minimum units required for this degree must be in courses meeting on the Urbana-Champaign campus. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A thesis is not required.

Master of Science. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, acceptable scores on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for those individuals desiring to study a particular area of interest in depth. Candidates for this degree must complete a minimum of 8 units, 4 of which must be in physical education courses and 2 in a discipline other than physical education. Three of the total units must be in 400-level courses. Of the 4 units in physical education, Physical Education 495 (Techniques of Research in Health, Physical Education, and Recreation) or an equivalent graduate-level research methods course appropriate to a student's

program of study is required. At least one-half of the minimum units must be in courses meeting on the Urbana-Champaign campus. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A student may choose to write an acceptable thesis for 2 units of credit (i.e., Physical Education 499) or select a nonthesis option by substituting 2 units of approved credit that includes at least 1 unit of Physical Education 493 (Independent Study).

Doctor of Philosophy. Admission to this degree program requires a master's degree from an accredited institution of higher education, completion of a thesis or equivalent research experience, a minimum grade-point average of 4.5 (A = 5.0) for all graduate work, acceptable scores on the Miller Analogies Test and aptitude portions of the Graduate Record Examination, and three letters of recommendation. Doctor of Philosophy degree candidates pursue an advanced program of study and research in preparation for careers in scholarly research and teaching. Candidates must complete 16 units of work beyond the master's degree, including 4 units in another discipline and 8 units of thesis research. Major areas of faculty research and particular specializations include: (1) bioscience of physical activity (physiology of fitness/human performance and sports medicine), (2) social science of sport (sport psychology and sport sociology), (3) human movement studies (biomechanics and motor learning), (4) administrative and curriculum studies (including professional preparation and program design, curriculum development, and evaluation). Ph.D. candidates are required to demonstrate competence in research methodology appropriate to their area of study. They must also successfully complete the preliminary and final doctoral examinations.

Research Facilities. In support of its graduate programs and research efforts, the Department of Physical Education maintains several research facilities, including the Biomechanics Research Laboratory, the Motor Behavior Laboratory, the Physical Fitness Research Laboratory, Sports Injuries Research, and a computer facility.

Financial Aid. A number of teaching assistantships are available in the department's instructional programs; priority is given to applicants with professional teaching experience. A limited number of research assistantships are available to support the departmental research laboratories. Assistantships normally provide a stipend for services performed, as well as a waiver of tuition and service fees.

PHYSICAL SCIENCES

Correspondence and Information: D. H. Secrest, University of Illinois at Urbana-Champaign, 155 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801

Graduate Degree Programs. Two degree programs in physical sciences, one leading to the Master of Science and the other leading to the Master of Science in the Teaching of Physical Sciences, are offered for active or potential secondary school teachers. Teacher certification is required for admission to either program. A thesis is optional. No more than 2 units of thesis credit may be applied toward degree requirements. There is no language requirement. At least 3 units of credit applied to these degrees must be at the 400 level.

Master of Science. This program is designed to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa.

All courses in astronomy, chemistry, computer science, geology, mathematics, and physics which normally may be applied for graduate credit are acceptable toward

the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus for which calculus is a prerequisite.

Master of Science in the Teaching of the Physical Sciences. Students in this program must earn 4 units in the physical sciences, 2 units in education (see page 104), and 2 units of electives in education or physical science, or, in exceptional cases, in other fields.

PHYSICS

Head of the Department: R. O. Simmons

Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, 215 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. Alpert, A. C. Anderson, G. Ascoli, G. A. Baym, S. A. Bowhill, F. C. Brown, M. K. Brussel, L. S. Cardman, S.-J. Chang, P. G. Debrunner, P. T. Debevec, H. G. Drickamer, G. Ehrlich, B. I. Eisenstein, R. A. Eisenstein, C. P. Flynn, H. Frauenfelder, D. M. Ginsberg, E. L. Goldwasser, A. V. Granato, P. Handler, L. E. Holloway, N. Holonyak, J. P. Hummel, I. Iben, E. A. Jackson, L. M. Jones, M. V. Klein, J. Kogut, U. E. Kruse, F. K. Lamb, D. Lazarus, A. J. Leggett, D. E. Mapother, J. M. Mochel, T. Ch. Mouschovias, A. M. Nathan, T. A. O'Halloran, V. R. Pandharipande, C. J. Pethick, D. Pines, F. M. Propst, M. J. Raether, D. G. Ravenhall, C. T. Sah, M. B. Salamon, R. O. Simmons, C. P. Slichter, L. L. Smarr, J. H. Smith, J. N. Snyder, J. D. Stack, H. J. Stapleton, J. D. Sullivan, J. W. Truran, W. D. Watson, A. Wattenberg, W. S. Williams, J. P. Wolfe, P. G. Wolynes, M. Wortis, H. W. Wyld

Associate Professors: T. C. Chiang E. H. Fradkin, G. E. Gladding, E. Gratton, M. H. Nayfeh, C. N. Papanicolas, R. L. Schult, M. Stone, D. C. Sutton, J. J. Thaler, M. B. Weissman, J. E. Wiss, H. Zabel

Assistant Professors: Y. C. Chang, S. Errede, N. D. Goldenfeld, J. M. Izen, Y. Oono, J. Van Harlingen, G. M. Mozurkewich, J. Wambach

Graduate Degree Programs. The Department of Physics offers graduate work leading to the Master of Science and the Doctor of Philosophy. There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, biomolecular, and surface physics; the properties of liquid helium; laser spectroscopy of atoms; and plasma physics. Graduate study in atmospheric physics, aeronomy, and in several areas of applied physics is available in conjunction with other departments in the University.

Admission. Requirements for admission to the graduate program in physics, in addition to those of the Graduate College, are 20 hours of physics, excluding courses in general physics and including a semester of intermediate theoretical mechanics, and two semesters of intermediate electricity and magnetism or the equivalent. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics, and undergraduate study of a foreign language are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science. This program requires 8 units of graduate courses and is usually completed in one year of full-time study by students entering in full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the graduate advising office of the Department of Physics.

Doctor of Philosophy. Students working for the Ph.D. degree usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following eighteen months. Departmental requirements for the Doctor of Philosophy, in addition to the general requirements of the Graduate College, are described in a pamphlet which may be obtained from the graduate advising office of the Department of Physics.

Related Programs. For information concerning applications of mathematics to the physical sciences, see page 145; for information concerning astronomy, see page 83; for information concerning atmospheric sciences, see page 84; for information concerning biophysics, see page 142; for information concerning geophysics, see page 118. A doctoral program in chemical physics is described on page 90.

PLANT PATHOLOGY

Head of the Department: RICHARD E. FORD

Correspondence and Information: Head of the Department of Plant Pathology, University of Illinois at Urbana-Champaign, N519 Turner Hall, 1102 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. E. FORD, E. B. HIMELICK, B. J. JACOBSEN, S. M. LIM, R. D. NEELY, D. F. SCHOENEWEISS, P. D. SHAW, M. C. SHURTLEFF, J. B. SINCLAIR

Associate Professors: J. L. CRANE, C. J. D'ARCY, D. I. EDWARDS, L. E. GRAY, M. E. IRWIN, H. JEDLINSKI, R. B. MALEK, J. D. PAXTON, S. M. RIES, D. G. WHITE

Assistant Professors: C. E. EASTMAN, D. A. GLAWE, H. W. KIRBY, T. A. MELTON III, G. R. NOEL, J. K. PATAKY, W. L. PEDERSEN, H. T. WILKINSON

Graduate Degree Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the Master of Science and Doctor of Philosophy degrees. All students are required to present themselves for an oral examination in plant pathology before their program-of-study committee after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; mycology; phytobacteriology; fungicides; antibiotics; physiology of fungi; biochemistry of plant diseases; disease resistance; etiology; epiphytology; soil-borne diseases; and variability in plant pathogens.

Admission. Applicants for graduate study are screened by a departmental admissions committee. The Graduate College requirements, including the 4.0 (A = 5.0) minimum grade-point average, apply.

Master of Science. A candidate for the Master of Science must complete 8 units of credit, including the presentation of an acceptable thesis, and pass an oral examination. Three units must be in 400-level courses, and 2 of the 3 must be in the major field. Limited credit in equivalent courses earned at other institutions may be accepted at the discretion of the department head and the student's program-of-study committee. The candidate must maintain an average of 4.0 (A = 5.0) for the master's program.

Doctor of Philosophy. Students working toward the Ph.D. degree usually require three to four additional years beyond the master's. Eight units of course work, including required courses, must be completed beyond the master's degree to qualify for the preliminary examination. An oral preliminary examination before five faculty members, including at least three within and one from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable thesis. A grade-point average of at least 4.0 is required for the Ph.D. degree.

POLITICAL SCIENCE

Head of the Department: ROGER E. KANET

Correspondence and Information: Graduate Studies Director, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: I. H. CARMEN, S. P. COHEN, B. GLAD, S. K. GOVE, R. E. KANET, E. A. KOLODZIEJ, D. F. LINOWES, R. L. MERRITT, S. S. NAGEL, P. R. NARDULLI, M. B. PRESTON, R. E. SCOTT, L. G. SELIGMAN, M. G. WEINBAUM, R. WEISSBERG, F. M. WIRT, G. T. YU, D. A. ZINNES

Associate Professors: B. CARROLL, C. CIOFFI-REVILLA, S. A. DOUGLAS, A. B. FIELDS, J. H. KUKLINSKI, S. T. SEITZ, M. E. WEINSTEIN

Assistant Professors: J. W. FOSSETT, P. A. HEILIG, M. A. KRASSA, D. M. PINDERHUGHES

Graduate Degree Programs. The Department of Political Science offers graduate work leading to the degrees of Master of Arts, Master of Arts in Public Administration, and Doctor of Philosophy. Graduate work is conducted in the following special fields: American government and politics, comparative politics, international relations, political behavior, political theory, and public policy and administration.

Admission. The Graduate College admission requirements apply for all programs. The student should have had a minimum of 20 hours of undergraduate work in political science and cognate disciplines such as economics, psychology, finance, sociology, and/or history. All applicants are required to submit Graduate Record Examination scores, and applicants with prior graduate work are required to submit an example of work written while a graduate student. The minimum TOEFL score for foreign applicants whose native language is not English is 590.

Master of Arts. Requirements for the master's degree include 8 units of credit and an acceptable thesis or a substantial research essay in a departmental course.

Master of Arts in Public Administration. See Public Administration for further details.

Doctor of Philosophy. A minimum of 24 units is required for the Ph.D. These include 8 units earned toward the master's degree, a minimum of 8 units of coursework for the doctorate, and 8 units of dissertation work. Courses taken to fulfill the language-skill requirement are not counted toward the minimum credit requirements. The A.M. degree is not a prerequisite to the doctorate program. Students must be admitted to candidacy and should apply for admission to candidacy in their fourth semester of graduate training. A minimum of three years of full-time study is necessary to complete the doctoral degree of which two must be spent in residence.

A doctoral candidate must take at least one proseminar in four of the six fields into which the political science curriculum currently is divided. The language-skill requirements may be met by demonstrating competence either in foreign languages, in quantitative methods and analysis, or in a combination of these as appropriate to the candidate's research interests. Preliminary examinations, written and oral, are required after completion of 16 units beyond the bachelor's degree. The preliminary examinations test competence in a major area of political science and in two minor areas, one of which may be outside the department. Approval of the dissertation proposal will occur within the semester in which the preliminary examinations are passed or no later than two months after successful completion of the examinations. The department also requires Ph.D. candidates to serve for two semesters as teaching assistants as part of their academic work, such experience being considered a vital part of the graduate program. Further information on all these programs may be obtained by writing directly to the department's office of graduate studies.

Financial Aid. A majority of first-year, as well as continuing, graduate students receive financial assistance from one of several sources. The department has a number of endowed fellowships; these, along with University Fellowships, provide a stipend

for at least nine months plus a waiver of tuition and service fees. Departmental teaching and research assistantships provide a nine-month salary and a waiver of tuition and service fees. Several additional tuition and service fee waivers are also available.

PSYCHOLOGY

Head of the Department: EMANUEL DONCHIN

Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 337 Psychology Building, 603 East Daniel Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: J. A. ADAMS, P. ARABIE, D. A. BERNSTEIN, D. BIRCH, M. BIRNBAUM, W. BREWER, J. CAMPIONE, S. CARTER-PORGES, G. L. CLORE, J. B. COHEN, M. COLES, J. H. DAVIS, E. DONCHIN, D. E. DULANY, C. DWECK, C. W. ERIKSEN, M. FISHBEIN, M. GABRIEL, J. GOTTMAN, W. T. GREENOUGH, J. HIRSCH, C. O. HOPKINS, C. L. HULIN, L. JONES, F. KANFER, S. KOMORITA, P. R. LAUGHLIN, J. E. MCGRATH, D. MEDIN, R. D. PARKE, S. PORGES, J. RAPPAPORT, E. SATINOFF, E. SEIDMAN, H. C. TRIANDIS, M. WEIR, C. WICKENS, R. WYER

Associate Professors: E. DEINER, D. GENTNER, G. Z. GREENBERG, R. HENDERSEN, J. MALPELI, E. NEWPORT, E. ROY, W. SCHNEIDER, E. J. SHOBEN,T. SRULL, C. TRAHIOTIS, S. WASSERMAN

Assistant Professors: J. ANDERSEN, R. BAILLARGEON, M. BANICH, P. BOWMAN, F. DRASGOW, F. FINCHAM, J. FLACH, B. HIRSCH, D. KLEIN, A. KRAMER, G. LINTERN, G. MILLER, D. PHILLIPS, B. ROSS, P. SANDERSON, E. WEBER, F. WHITE

Professors Emeriti: F. COSTIN, H. W. HAKE, L. G. HUMPHREYS, P. TEITELBAUM

Graduate Degree Programs. The Department of Psychology offers graduate work leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy.

Doctor of Philosophy programs are offered in the following areas of psychology: biological, developmental, experimental, clinical, measurement, personality and social ecology, and social/organizational individual differences. The Master of Arts degree is awarded to students in the above programs as an intermediate degree. Master of Science programs are offered as terminal degrees in personnel psychology, engineering psychology, and measurement psychology.

Admission. The Graduate College admission requirements apply for all programs. The candidate for admission to a Master of Arts or Doctor of Philosophy program should ordinarily have the following preparation: a minimum of 15 hours in psychology, a laboratory course in experimental psychology, a course in statistics, a one-year course in another laboratory science, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have some research experience. Applications for admission to part-time study are usually not approved.

Master of Arts. The Master of Arts degree is awarded as an intermediate degree to students who are candidates for the Doctor of Philosophy degree when they have satisfactorily completed 8 units of graduate work, including an acceptable thesis.

Master of Science. The Master of Science degree in personnel psychology, in engineering psychology, or in applied measurement is awarded as a terminal degree to candidates who have had an appropriate applied psychology undergraduate program and who now satisfactorily complete 8 prescribed graduate units in their specialty.

Doctor of Philosophy. The Doctor of Philosophy degree is awarded to candidates who complete an approved program in their area of specialization and meet departmental and Graduate College requirements for the degree. These must include: at least 24 graduate units beyond the bachelor's degree; satisfactory performance in courses or examinations dealing with quantitative methods, conceptual foundations

of psychology, and chosen areas of specialization; a master's thesis or equivalent; appropriate advanced courses and seminars in the area of specialization and in related and supporting areas; satisfactory performance on a doctoral qualifying examination; satisfactory performance on an oral preliminary examination; and completion of an acceptable Ph.D. thesis and satisfactory performance on an oral examination in defense of the thesis.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. This usually takes the form of a teaching assistantship for at least one semester.

Medical Scholars Program. This program allows the student interested in medicine and psychology to earn both the M.D. and Ph.D. (in psychology) degrees while gaining unique multidisciplinary research experience and expertise.

Individually tailored programs of study can be developed within the general requirements of medical training and graduate study in psychology. Degree work will be arranged to accommodate the scheduling requirements of both programs, but the course of study in psychology will be equivalent to that of all other doctoral candidates. More details about the Medical Scholars Program are available from Associate Dean for Academic Affairs, College of Medicine at Urbana-Champaign, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

PUBLIC ADMINISTRATION

Correspondence and Information: Director, Public Administration Program, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

Graduate Degree Program. The graduate program leading to the Master of Arts in Public Administration is being revised. For current information on the program, contact the Program Director.

RADIO AND TELEVISION

Acting Head of the Department: JAMES W. CAREY

Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

The Department of Radio and Television has suspended admission to its program leading to the Master of Science degree while it reviews the curriculum and decides on its plans for future instruction in broadcasting. Students interested in earning a master's degree in radio and television may write to the department head to learn the status of the department's plans. For the program leading to the Doctor of Philosophy in Communications, see page 96.

REGIONAL SCIENCE PROGRAM

Correspondence and Information: Regional Science Program, University of Illinois at Urbana-Champaign, 107-109 Observatory, 901 South Mathews Avenue, Urbana, Illinois 61801

Program Committee: D. E. BOYCE (chairperson), P. F. COLWELL, A. GETIS, G. J. D. HEWINGS, L. D. HOPKINS, T. J. KIM, C. D. KOLSTAD, H. F. WILLIAMSON

Graduate Degree Programs. An interdisciplinary concentration in regional science is available for students enrolled in master's or doctoral degree programs in the following departments: Civil Engineering, Economics, Finance, Geography, Landscape

Architecture, or Urban and Regional Planning. Program concentration varies by department and includes emphasis in transportation planning, regional development and planning, real estate and urban land economics, urban and regional analysis, and environmental systems and management. Core courses are taken in regional and social science theory, location theory, and methods of regional analysis. The specific core courses taken will depend upon background and major department. Further specialization may be pursued by making approved selections from among a rich array of more than forty regional science courses in the participating departments.

Admission. Prospective students should address inquiries to the program office. Applicants desiring a major or minor emphasis in regional science should seek admission to one of the cooperating departments. All degree candidates must complete the requirements of the department in which they enroll. Students specializing in regional science are expected to have a sound background in economics, statistics, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study.

RELIGIOUS STUDIES

Director of the Program: GARY G. PORTON

Correspondence and Information: Program in Religious Studies, University of Illinois at Urbana-Champaign, 4016 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

The Program of Religious Studies, one of thirteen units in the School of Humanities, sponsors teaching, research, and public service in religious studies. Although the program does not itself offer graduate degrees, its eleven core faculty members, as well as its seventeen associated faculty members, regularly teach graduate-level courses and serve on thesis committees for other departments. Students interested in pursuing graduate work in religious studies should contact the director of the program to determine how they can best pursue their interests.

ROMANCE LINGUISTICS

Graduate Degree Programs. An option in Romance linguistics is available to candidates for the Doctor of Philosophy in the Departments of French; Linguistics; and Spanish, Italian, and Portuguese. The curriculum is based upon appropriate course offerings in the three departments. Further information may be obtained from the executive officers of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: R. T. FISHER, JR.

Correspondence and Information: Director of the Russian and East European Center, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. P. BERNARD, W. C. BLAYLOCK, M. T. CHOLDIN, C. L. DAWSON, F. DOVRING, J. D. FELLMANN, R. T. FISHER, JR., M. FRIEDBERG, B. GLAD, J. GORECKI, F. M. GOTTHEIL, K. A. HITCHINS, D. R. HODGMAN, R. E. KANET, M. J. KENSTOWICZ, P. B. MAGGS, M. MARCOVICH, J. P. MCKAY, J. R. MILLAR, L. H. MILLER, B. NETTL, J. A. NICHOLS, T. PACHMUSS, A. L. RINGER, S. C. SCHMIDT, H. M. SCHOENFELD, P. W. SCHROEDER, R. E. SCOTT, D. M. SHTOHRYN, M. G. WEINBAUM, L. ZGUSTA

Associate Professors: M. H. BERRY, E. C. BRISTOL, C. CIOFFI-REVILLA, R. DUNATOV,

F. Y. Gladney, S. P. Hill, H. H. Hock, R. C. Jennings, H. P. Maguire, K. H. Schoeps, M. M. Shorish, B. P. Uroff, M. E. Weinstein
Assistant Professors: D. Koenker, R. G. Ousterhout, D. Prochaska, O. Soffer-Bobyshev, R. Tempest

Graduate Degree Programs. Graduate programs in Russian language and area studies are offered by the Russian and East European Center in cooperation with various departments. The three programs listed below are designed to accompany work in a standard discipline such as anthropology or economics. Accordingly, it is the department of the student's primary discipline which receives and acts on the application for admission. Since it is the student's home department that determines the acceptability of various minor fields, the minors proposed here are merely suggestions for the consideration of that department.

Minor for the Master's Degree. A candidate for the master's degree who elects Russian language and area studies as a minor should earn at least 2 units of graduate credit in courses devoted to Russia and chosen from the fields of anthropology, economics, geography, history, law, library science, literature, political science, and sociology, and should have completed Russian 104 or 401, or the equivalent.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects Russian language and area studies as a minor must demonstrate a reading command of Russian as tested by examination or by completion of Russian 104 or 401 with a grade of A or B, and, in addition, should earn at least 4 units of graduate credit in the group of relevant courses defined above. The 4 units should include courses from at least two departments outside of, and may at the same time include up to 1 unit from within, the department offering the candidate's major.

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is awarded by the Graduate College and the Russian and East European Center. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follows: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least 6 graduate units in course work relating to Russia, distributed among at least three of the departments represented in the program (Anthropology, Economics, Geography, History, Law, Library and Information Science, Political Science, Slavic Languages and Literatures, and Sociology) other than the student's own major department. If the student's major department is one of these nine, up to 1 unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources which must meet, at the minimum, the standard normally required in a master's thesis. A copy of the student's master's or doctoral thesis may be submitted in fulfillment of this requirement.

SLAVIC LANGUAGES AND LITERATURES

(Including Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Bulgarian, and Ukrainian)

Head of the Department: Maurice Friedberg
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C. L. Dawson, M. Friedberg, M. J. Kenstowicz, T. Pachmuss
Associate Professors: E. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill
Assistant Professor: R. Tempest

Graduate Degree Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of Master of Arts in Russian, Master of

Arts in the Teaching of Russian, and Doctor of Philosophy with specialization in Russian literature or Slavic linguistics.

Admission. Prospective graduate students of Slavic languages and literatures should have had the equivalent of at least three years of college Russian and some advanced course work in Russian literature. Some acquaintance with other languages and literatures is desirable. Students choosing Russian or other Slavic languages and literatures as a minor subject should consult the department. The Graduate College admission requirements apply.

Master of Arts in Russian. In addition to fulfilling the requirements of the Graduate College, candidates must pass both a written and an oral examination in their major and must pass the Russian proficiency examination. Students may specialize in literature or linguistics. All students must complete a departmental core program comprised of courses in literature and linguistics. No master's thesis is required.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian, 5 units including at least 2 units from courses open only to graduate students; (2) education, 2 units including 1 unit in educational psychology and 1 unit in educational policy studies; and (3) electives, 1 unit. These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 103 for teacher certification requirements.

Doctor of Philosophy. All candidates for the Ph.D. must fulfill the general requirements of the Graduate College and must have a reading knowledge of two non-Slavic languages, ordinarily French and German. A student may choose literature or linguistics as a major field. In addition to satisfying departmental language proficiency requirements, students must complete 8 units of course work beyond the A.M. degree, of which at least 5 are within the student's major field of study. The student must also complete a minor consisting of three graduate-level courses in a single field or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another modern Slavic language or literature in the original language. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other modern Slavic languages or literatures in the original languages. A thesis is required for the degree of Doctor of Philosophy.

Graduate courses are offered in the following Slavic languages: Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Bulgarian, and Ukrainian.

Financial Aid. Several forms of financial assistance, including University Fellowships, Foreign Language and Area Studies (Title VI) fellowships, teaching assistantships, research assistantships, and tuition and service fee waivers are available. There are also opportunities for part-time related work in the Slavic and East European Division of the University Library and elsewhere on the campus. Virtually all superior students are assured of some form of financial assistance and also receive the opportunity to acquire classroom teaching experience.

Research Interests. Major areas include East, West, and South Slavic linguistics; language teaching pedagogy; and computer-assisted language teaching. In literature, the fields of specialization include Russian literature of all periods, particularly of the nineteenth and twentieth centuries, Russian literature and society, émigré Russian literature, the Russian romantic and symbolist poets, Russo-Western literary and cultural contacts, and Russo-Jewish literary relations. Other major areas of interest represented include the Soviet and East European cinema, literary translation, Polish literature, and Slavic folklore.

The University of Illinois at Urbana-Champaign has one of the country's two or three outstanding Slavic library collections. The Illinois Summer Research Laboratory on Russia and Eastern Europe brings to the campus more than one hundred postdoctoral researchers from all over the country every year to take advantage of

the Slavic library resources. The library's unique Slavic reference service is in year-round operation, answering queries from libraries and individual scholars throughout the country.

SOCIAL STUDIES

Correspondence and Information: J. R. Dahl, Director of the Program, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

Master of Arts in the Teaching of Social Studies. Candidates for admission should hold secondary school social studies teaching certificates. The Graduate College admission requirements apply.

Graduate Degree Program. Eight units of graduate work are required. Four units are to be in the social studies (2 of these must be in history); 3 units in educational psychology, educational policy studies, and secondary and continuing education; and 1 unit in an elective chosen in consultation with the director of the program.

SOCIAL WORK

Dean of the School: Robert O. Washington
Correspondence and Information: Assistant Dean, School of Social Work, University of Illinois at Urbana-Champaign, 1207 West Oregon Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. R. Balgopal, L. B. Costin, K. Gould, E. V. Mech, M. A. Taber, R. O. Washington
Associate Professors: R. M. Berger, C. D. Cowger, R. A. Downing, M. L. Flynn, E. N. Gullerud, J. D. Kagle, P. A. Meares, M. M. Monkman, A. J. Vattano, S. A. Wattenberg, N. A. Weinberg
Assistant Professors: M. A. Patchner, K. O. Proch

Graduate Degree Programs. The School of Social Work offers programs leading to the Master of Social Work and the Doctor of Philosophy degrees.

Admission. For the M.S.W. program, applicants must meet the following minimum requirements: (1) Graduation from an accredited college or university with requirements for the bachelor's degree comparable to those of the University of Illinois at Urbana-Champaign. (2) An undergraduate grade-point average of at least 4.0 (A = 5.0) for the last 60 semester hours of undergraduate classes and any graduate work completed. (3) A supplementary statement submitted with the application for admission to the School of Social Work. This is a very important document in support of the application. The outline for this statement appears on the last page of the school's application form. (4) Evidence of personal qualifications suitable to the profession of social work. (5) A minimum of 20 hours in social science courses. (6) A course in statistics. (7) A course in human development covering the life span. (8) Foundation knowledge in human behavior in the social environment including the family, small groups, communities, and organizations. (9) A course in research methods.

The Ph.D. program is designed for students who demonstrate leadership potential and have an advanced degree in a human services profession. A grade-point average of 4.0 (A = 5.0) is required for consideration. Applicants must submit Graduate Record Examination scores on the tests of verbal and quantitative ability.

Master of Social Work. The M.S.W. curriculum may be completed in eighteen months of continuous full-time study. A sixteen-month program is available for students who hold the B.S.W. degree from an accredited institution. Students are encouraged to include electives from other departments. A twenty-nine-week field placement in a social service agency is required. Specializations include child welfare,

community mental health, school social work, and health care. There is a direct service and an indirect service track option within each specialization. Students may also develop programs in the following areas: aging, industrial social work, marriage and family practice, and substance abuse.

Doctor of Philosophy. The Ph.D. program is typically a 16-unit program for students who enter with an M.S.W. degree and is interdisciplinary with a strong research emphasis. Anthropology, economics, education, labor and industrial relations, political science, law, psychology, sociology, and urban planning are among the disciplines that contribute to the program. Candidates are prepared for leadership in teaching, research, policy analysis, development, and implementation.

SOCIOLOGY

Acting Head of the Department: JAMES R. KLUEGEL
Director of Graduate Studies: CLARK MCPHAIL
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. ARABIE, D. J. BORDUA, H. CHOLDIN, N. DENZIN, F. FLIEGEL, J. GORECKI, L. HARGENS, N. JACOBS, H. M. JOHNSON, B. KARSH, J. R. KLUEGEL, G. LUESCHEN, B. RESKIN, J. ROBINSON, R. SCHOEN, J. SPAETH, S. SUDMAN, J. C. VAN ES, R. WARNECKE, S. WASSERMAN
Associate Professors: W. COCKERHAM, R. JONES, C. MCPHAIL, G. MCWORTER, J. MIROWSKY, A. PICKERING, C. ROSS, A. SOFRANKO, M. SOLAUN, K. SOUTHWOOD, N. WILEY
Assistant Professors: C. ALBONETTI, A. FLOOD, C. ROSS, R. SAMPSON, G. STEVENS, G. SWICEGOOD, W. TRENT
Professor Emeritus: WILLIAM FORM

Graduate Degree Programs. The Department of Sociology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees.

Admission. The Graduate College admission requirements apply. Students applying for admission should have a strong background in one of the social sciences, preferably sociology. Applicants must submit Graduate Record Examination scores on the tests of verbal ability, quantitative ability, and the advanced test in sociology.

Doctor of Philosophy. Considerable specialization around a core of sociological knowledge is encouraged to prepare students for careers in research and teaching at the college and university level and for research careers in government and industry. Departmental programs include population studies; comparative sociology; law and society; social psychology; medical sociology; work, stratification, and organizations; and rural sociology. Required courses include sociological theory, statistics, research methods, demography, social organization, and social psychology. Candidates must also be examined in at least one substantive area plus an area of specialization for doctoral dissertation research. Additional information can be found in the *Sociology Handbook for Graduate Students,* available from the department.

Master of Arts. The Master of Arts program is generally viewed as a first (and optional) step toward the doctorate. Admission requirements are indicated above. A candidate for the A.M. degree in sociology must earn 10 units of graduate credit or 7 units of course work plus an acceptable master's thesis. The course work must include research methods and one advanced course in statistics.

Social Statistics. This program of study is for those who wish to apply statistical methods to the study of sociology. It fulfills the requirement for the degree of Master of Science (or of Arts) in statistics, administered by the Department of Mathematics, and may be pursued simultaneously with an advanced degree program in sociology. See the entry in this catalog under the heading Statistics.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan and Rumanian)

Head of the Department: I. A. SCHULMAN

Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: S. W. BALDWIN, W. C. BLAYLOCK, A. K. CASSELL, B. DUTTON, E. P. GARFIELD, R. E. LOTT, A. PORQUERAS-MAYO, M. D. SALTARELLI, I. A. SCHULMAN

Associate Professors: A. AIEX, M. A. LEWIS, T. C. MEEHAN, A. MUSUMECI, D. WANNER, J. C. WILCOX

Assistant Professor: J. LETT, B. VAN PATTEN

Graduate Degree Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy in Spanish, in Italian, or in Portuguese, and to a Master of Arts in the Teaching of Spanish. Fields of concentration are Spanish linguistics, Romance linguistics, Spanish literature, Latin American literature, Italian linguistics, Italian literature, and Portuguese language and literature. Graduate courses in Catalan and Rumanian are available.

Admission. The Graduate College admission requirements apply. The normal prerequisite for a graduate major is an undergraduate major in a Romance language or consent of the department. Applicants living in the United States must submit Graduate Record Examination scores for the aptitude test (advanced test also required for candidates in Spanish). Students doing graduate work for any advanced degree in Spanish, Italian, or Portuguese must possess or acquire a practical command of the language. Parallel training in one or more other languages or literatures, such as English, French, German, Greek, or Latin, is desirable.

The programs in Spanish are described below. Similar programs are available for students who wish to major in Italian or Portuguese. For additional information consult the department.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and on a general reading list. Three areas of specialization are offered: Spanish and Spanish American literature, Spanish linguistics, and the teaching of Spanish. Detailed statements of the course requirements for each specialization may be obtained from the department.

Master of Arts in the Teaching of Spanish. An applicant must have a bachelor's degree in either Spanish or teacher education. Candidates must complete a total of 9 units to be taken in various areas (Spanish, foreign language education, general education, psychology, etc.) approved by the adviser in conjunction with the candidate's interests, background, and needs. In addition to completion of course work, a candidate must pass a set of written exams designed to test the ability to integrate those areas studied into a coherent approach for the teaching of Spanish. While a Master of Arts in the Teaching of Spanish (M.A.T.S.) is normally considered terminal, exceptional students may be admitted into the Second Language Acquisition in Teacher Education (SLATE) Ph.D. program (see below).

Doctor of Philosophy. Students working toward the Doctor of Philosophy degree are admitted with provisional departmental status until their performance in graduate work is judged acceptable for full departmental status by the department's graduate committee. A comprehensive written examination is used as a basis for this judgment. Candidates are required to present evidence of a reading knowledge of French and of one other language to be selected in consultation with the adviser.

Six areas of specialization are available: medieval literature, Renaissance and Golden Age, Spanish literature of the nineteenth and twentieth centuries, Latin

American literature, Spanish linguistics, and Romance linguistics. For the specialization in Spanish linguistics, general linguistics is a required minor; the department should be consulted on the selection of minors for the other specializations.

An additional option in Second Language Acquisition in Teacher Education (SLATE) is available to candidates with an A.M. or M.A.T. degree in Spanish and at least one year of experience in teaching Spanish as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology in addition to advanced study in Spanish language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. The departmental requirement is that Ph.D. candidates must teach the equivalent of one academic year at 50-percent time in the basic language course sequences of the department.

It should be noted that the department has been developing procedures for application of computers to problems related to humanistic scholarship and wishes to encourage their use in thesis research.

Financial Aid. The department offers fellowships to outstanding applicants to the graduate program and regularly provides a large number of teaching assistantships as well as some research assistantships.

SPEECH AND HEARING SCIENCE

Head of the Department: ROBERT C. BILGER
Correspondence and Information: Head, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, 901 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R. C. BILGER, J. J. O'NEILL, E. YAIRI
Associate Professors: J. G. ERICKSON, D. P. KUEHN, M. A. O'NEILL, R. K. SIMPSON, C. TRAHIOTIS
Assistant Professors: A. E. CARNEY, R. D. CHAMBERS, C. J. JOHNSON, L. E. ROWAN
Professors Emeriti: F. JOHNSON, E. PADEN, W. R. ZEMLIN

Graduate Degree Programs. The department offers courses leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees, with specialization in speech pathology, audiology, language development and its disorders, and speech or hearing science.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination is required for all curricula. Desired background should include 16 hours of undergraduate credit in the following areas or their equivalent: speech pathology, audiology, phonetics, anatomy and physiology of the vocal mechanism, hearing science, or speech science, and/or voice science.

Master of Science. The program leading to the degree of Master of Science is usually considered to be a terminal program for the purpose of training competent clinicians who intend to seek employment in the school environment. It provides comprehensive knowledge of the various types of speech, hearing, and language disorders; their causes; the principles of diagnostic and therapeutic management; and course and practicum work in the school speech and language program, including student teaching. It is designed to meet the academic and clinical requirements for state and American Speech-Language-Hearing Association (ASHA) certification. For students entering with no deficiencies, this program requires: (1) 8 units of courses appropriate to the areas of speech pathology, audiology, or language; (2) 2 units from selected courses in professional education; and (3) appropriate practicum, including practice teaching.

Master of Arts. In pursuing a Master of Arts, the student may concentrate in one of five areas: clinical audiology, educational audiology, language development and its disorders, speech and hearing science, or speech pathology. This degree may be taken as either a terminal degree or as preparation for further graduate study.

As a terminal degree, the Master of Arts program is designed to ensure clinical competence in audiology or speech/language pathology necessary for employment in a hospital, clinic, private clinic, residential center, or school system. Successful completion of this program ensures that the student has met the academic and clinical requirements for ASHA certification and can possibly qualify for state certification.

As a nonterminal degree, the Master of Arts program lets the student take fundamental course work that will be an integral part of an overall doctoral program.

The student's program for the Master of Arts degree will be determined on an individual basis, taking into consideration the Graduate College and departmental requirements. It will be comprised of 10 to 13 units from the five specialized areas and related areas. At least 5 units must be at the 400 level. The only courses required of all Master of Arts candidates are Speech and Hearing Science 399 (Design and Analysis of Experiments in Speech and Hearing Science) and Speech and Hearing Science 496 (Proseminar in Speech and Hearing Science). A master's thesis should be part of the predoctoral student's plan of study. Students seeking a Master of Arts as a terminal degree are also free to do a thesis as educational enrichment.

Doctor of Philosophy. Admission to the doctoral program requires completion of a master's degree, or the equivalent, in speech and hearing science or a related area. The program may be planned with specialization in any one of the five areas: audiology, language development and its disorders, speech pathology, speech science, or hearing science. The minimum academic course requirements for this degree are 8 units beyond the master's degree and a thesis. If there are deficiencies in the student's background, additional courses will be required, and courses taken for this purpose are usually not counted toward the minimum requirement. In addition, doctoral candidates who did not write a thesis as part of their master's program will be required to complete the equivalent of a master's thesis, and these 2 units will not count toward the minimum academic requirement of 8 units. Individual programs of study will be tailored to the special needs of the student and are planned by the student and the adviser.

If the student enters with no deficiencies, the first year of two of the doctoral program is typically devoted to course work in the area of concentration selected by the student, and terminates when the preliminary examination is passed. Subsequent time is devoted to research on a special topic and culminates with the writing of a thesis and passing an oral examination in its defense.

SPEECH COMMUNICATION

Head of the Department: Jesse G. Delia
Director of Graduate Study: Daniel J. O'Keefe
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: K. E. Andersen, J. J. Bateman, J. G. Delia, C. Kramarae, J. H. Maclay, R. E. Nebergall
Associate Professors: R. A. Clark, L. Grossberg, D. E. Hewes, B. J. O'Keefe, D. J. O'Keefe, D. R. Seibold, D. L. Swanson, J. W. Wenzel
Assistant Professors: G. E. Cheney, C. M. Condit, T. M. Conley, R. L. Husband, B. A. Morris, S. K. Planalp

Graduate Degree Programs. The Department of Speech Communication offers

courses leading to the Master of Arts and Doctor of Philosophy and the Master of Arts in the Teaching of Speech Communication degrees.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination is required in all curricula. Applicants for admission to doctoral programs and all fellowship candidates are required to submit a sample of written academic work.

Master of Arts. For the degree of Master of Arts, students may concentrate in rhetorical and communication theory or in interpretation. The entering student should present the equivalent of 16 hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general graduation requirements of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional, but may constitute a maximum of 2 units of credit.

Master of Arts in the Teaching of Speech Communication. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College and departmental requirements, including the comprehensive examination, M.A.T. candidates must complete 6 units of work in the department plus the units of required work in education (see page 104).

Doctor of Philosophy. For the Doctor of Philosophy degree, students may concentrate in rhetoric and communication theory or interpretation. Students are accepted as candidates for the Ph.D. degree who present either a well-rounded undergraduate education with an emphasis in speech communication and a master's in a cognate discipline, or who hold a master's degree in speech communication from an accredited institution.

In addition to meeting general requirements of the Graduate College, the student must satisfactorily complete written and oral preliminary examinations, an oral defense of the thesis prospectus, and an oral defense of the thesis. Students must demonstrate competency in research procedures and tools that may include proficiency in one or more foreign languages, various research methodologies and tools, or cognate academic work.

Specific information on programs of graduate study and financial aid is supplied to all who request it. Financial aid is usually in the form of part-time teaching assistantships.

STATISTICS

Head of the Department: JEROME SACKS
Correspondence and Information: Department of Statistics, University of Illinois at Urbana-Champaign, 221 Altgeld Hall, 1409 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. E. BOHRER, K. JOAG-DEV, S. L. PORTNOY, J. SACKS, R. A. WIJSMAN
Associate Professors: D. D. COX, J. I. MARDEN, S. WASSERMAN
Assistant Professors: A. R. BARRON, D. JENNINGS, A. MARTINSEK, D. G. SIMPSON
Adjunct Professor: JAMES COLE

Graduate Degree Programs. The Department of Statistics offers graduate study leading to the Master of Science (or of Arts) and the Doctor of Philosophy degrees in statistics.

Admission. The Graduate College admission requirements apply. Students are expected to have a strong undergraduate mathematics background but need not have an undergraduate mathematics degree. Students may be admitted with deficiencies which are to be removed during the first year of graduate study.

Master's Degree Program. The M.S. and A.M. degrees in statistics require 8 units

of graduate course work covering both theoretical and applied material. Statistics 324, 325, 326, 327, 410, and 411 are required. At least one additional course at the 400 level is also required. There is no language or thesis required, and there are no comprehensive examinations.

Doctoral Degree Program. A total of 24 units after the baccalaureate is required for the Doctor of Philosophy degree. These include Statistics 324, 325, 326, 327, 410, 411, 425, 471, 475, and Mathematics 366. In addition, either Mathematics 481-482 or Mathematics 451-452 is required. The degree also requires successful completion of the qualifying examination; the language requirement; the preliminary examination (consisting of one required unit in statistical theory); Statistics 410-411; one required unit in probability theory; either Mathematics 481-482 or Mathematics 451-452; two units in advanced areas; and a thesis in an area of theoretical or methodological statistical research.

Financial Aid. Financial aid is available primarily in the form of teaching assistantships; some fellowships and research assistantships are also available. For further information write to the head of the department.

Applied Statistics Program. The Graduate College Statistics Program and the Department of Statistics offer the Master of Science degree in statistics with specialization in a variety of areas of application. The degree program consists of a core of three courses in basic statistical theory from the Department of Statistics, a course in general data analysis, and further course work in a particular discipline as required separately for each specialization. The program offers an additional degree for students earning an advanced degree in the area of application or provides the primary degree for a master's candidate in applied statistics who is interested in specific disciplinary application.

To be eligible for this program, a student must be accepted into either the unit offering the specialization or the Department of Statistics. The following areas of application are now available: social statistics (Department of Sociology, School of Social Sciences); psychometrics and behavioral statistics (Departments of Psychology, Educational Psychology, Speech and Hearing Science); biostatistics (biological or health sciences); statistical genetics (Departments of Agronomy, Animal Sciences).

Full statements of degree requirements are available from the head of the unit offering a specialization or from the head of the department.

THEATRE

Head of the Department: ROBERT GRAVES
Correspondence and Information: Head, Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. C. AHART, J. B. HARRIS, B. M. HOBGOOD, D. KNIGHT, W. MCCLURE KNIGHT, R. TYMCHYSHYN, B. R. WORKS
Associate Professors: J. DUNN, R. GRAVES, R. ISACKES
Assistant Professor: C. LIBKIN

Graduate Degree Programs. The Department of Theatre offers graduate work leading to the Master of Arts, the Master of Fine Arts, and the Doctor of Philosophy.

Admission. Applicants will be considered if they present transcripts documenting undergraduate or graduate study of dramatic literature, theatre history, and theatre practice; in the case of the M.F.A. degree, intensive experience in performance and/or production of plays is necessary, whether or not this activity occurred in an academic context. The faculty expects all applicants to have a cumulative grade-point average of at least 4.0 (A = 5.0) in the study of theatre subjects; A.M. and Ph.D. candidates are to have a 4.0 grade-point average in all subjects studied at the graduate or undergraduate levels.

Master of Arts. A candidate for the A.M. degree must spend at least two semesters in residence; must complete at least 8 units of course work in theatre and related studies, including at least 5 units in history and theory of theatre and 2 in applied theatre; and must pass a final comprehensive examination. Three units must be at the 400 level, and 2 of the 3 must be in theatre. A full-time student can complete this program in one academic year.

Master of Fine Arts. The M.F.A. is a terminal degree in theatre practice. Approved areas of specialization include acting, directing, costume design, lighting design, scene design, and theatre technology. The candidate for the degree must be in residence six semesters and complete 18 units. Course work must include at least 8 units in studio, colloquium, or creative projects, and 3 others in department-approved electives. Only full-time students will be admitted to the program; residence only in summer sessions will not suffice.

Doctor of Philosophy. Requirements for the degree are a minimum of 8 units in courses in theatre and related studies beyond the master's degree; a reading knowledge of two foreign languages, or of one foreign language and one of the prescribed substitutes; a minimum of 8 units of thesis research; a comprehensive oral and written examination; and defense of the dissertation before a committee of the graduate faculty. The program requires two to three years beyond the master's degree to complete.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: FREDERICK A. LECKIE
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 216 Talbot Laboratory, 104 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. J. ADRIAN, D. E. CARLSON, M. E. CLARK, H. T. CORTEN, G. A. COSTELLO, R. A. EUBANKS, F. A. LECKIE, R. E. MILLER, J. W. PHILLIPS, R. T. SHIELD, J. S. WALKER, S. S. WANG, W. J. WORLEY
Associate Professors: J. G. HARRIS, R. E. JOHNSON, N. RIAHI
Assistant Professors: K. S. KIM, D. S. STEWART, R. L. WEAVER

Graduate Degree Programs. The graduate programs in the Department of Theoretical and Applied Mechanics lead to the Master of Science and Doctor of Philosophy degrees. Major areas of study and research are applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics.

Admission. Applicants should have the bachelor's or master's degree in engineering, mathematics, physics, or related fields and meet the Graduate College requirements for admission.

Master of Science. Candidates are required to complete a minimum of 8 units of graduate work including a thesis (ordinarily 2 units) and to maintain a minimum grade-point average of 4.0 (A = 5.0). Students are required to register for the seminar in engineering mechanics. If a student elects not to present a thesis, 9 units of course work are required. Three units must be at the 400 level, and 2 of the 3 must be in theoretical and applied mechanics. A full-time student can normally complete this program in one academic year of study. A student who has an assistantship can normally complete the requirements in one calendar year.

Doctor of Philosophy. Candidates for the Doctor of Philosophy degree are required to complete 8 units of course work beyond the master's degree with a minimum grade-point average of 4.0. One course (or the equivalent) is required from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics. Students are required to register for the seminar in engineering mechanics. A student must pass

an oral preliminary examination before commencing the thesis. The thesis research normally comprises about half of the work beyond the master's degree. A full-time student can normally complete the Ph.D. program in two years of study beyond the master's degree.

Financial Aid. Half-time teaching and research assistantships allow students to take three-quarters of a full schedule of graduate courses. For 1985-86, the half-time stipend for beginning students is $8,100 for the nine-month academic year plus exemption from tuition and service fees. Advanced students receive up to $8,700; qualified classroom teaching assistants receive a 60 percent appointment, raising the stipend to a level between $9,700 and $10,400. Assistantship applications can be made at any time before the term of entrance. Some University Fellowships are also available.

Research Interests. Some of the areas of theoretical and experimental research currently being investigated by graduate students and faculty members are: fracture control, crack propagation, metal fatigue, fiber-reinforced materials, cycle-dependent deformations, plasticity of composites, creep of metals and composites, elasticity, finite elastic deformations, structural optimization, thermoelasticity, elastic stability, evaluation of plasticity theories, finite element methods, dynamic photomechanics, numerical stress analysis, flow of viscous fluids, blood flow in arteries, biomechanics, turbulent boundary-layer theory, magnetohydrodynamics, non-Newtonian fluid flow, atmospheric turbulence, dynamics of springs and cables, elastic wave propagation, acoustics, vibrations of shells, vibration isolation, and combustion.

URBAN AND REGIONAL PLANNING

Head of the Department: LEWIS D. HOPKINS
Correspondence and Information: Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 1003 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. F. BLAIR, D. E. BOYCE, C. W. FORREST, E. C. FREUND, W. I. GOODMAN, A. Z. GUTTENBERG, L. F. HEUMANN, G. J. D. HEWINGS, L. D. HOPKINS, T. J. KIM
Associate Professor: G. C. LIM
Assistant Professors: E. R. JONES, L. L. OSBORNE, P. V. SCHAEFFER

Graduate Degree Programs. The Department of Urban and Regional Planning offers graduate work leading to the degrees of Master of Urban Planning and Doctor of Philosophy in Regional Planning.

Admission. While the social sciences, the physical sciences, the design professions, engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities and other fields. The Graduate College admission requirements apply. Foreign applicants must score 590 or better on the TOEFL. The Graduate Record Examination is recommended for persons who desire consideration for any type of financial aid. The additional requirements described below apply for admission to the doctoral program.

Master of Urban Planning. The master's degree program is designed to prepare students for careers in professional planning practice. Such careers can involve service in public agencies at any of the levels of government, in private consulting practice, or in other organizations in need of planning services. Alternatively, the program may prepare students for advanced work leading to the Ph.D. degree and a career in teaching and research. The program combines a set of minimum requirements with a high degree of flexibility and choice. The course of study ordinarily requires two years. First-year students take courses focusing on the basic elements of planning, including studies in planning theory, analytical methods, spatial organization, and

implementation. The second year provides opportunities for further work in areas of specialized interest, including environment and land use, housing and community development, transportation, socio-economic planning, preservation planning, and regional science. A thesis or a master's project (comparable to the thesis in scope but flexible in the types of projects which can be carried out) is required. An internship during the summer between the first and second year or participation in one of our international summer programs is highly recommended.

To qualify for the Master of Urban Planning degree, a student must complete a minimum of either: (1) 15 units, if a zero-credit internship course (Urban Planning 490) is successfully completed; or (2) 16 units, if the internship course is not elected. The internship must be preceded and succeeded by at least one semester of course work in residence on the University of Illinois at Urbana-Champaign campus. At least 10 units must be in urban and regional planning courses (9 units for students completing Urban Planning 490). At least 4 units must be at the 400 level, and 3 of these must be in urban and regional planning.

Doctor of Philosophy in Regional Planning. The doctoral program is offered in close cooperation with an interdisciplinary program faculty. The program is designed to educate researchers and teachers for university positions as well as specialized practitioners for the public and private sectors. Emphasis is on the social and natural science aspects of regional planning and the necessary background in research methods and planning theory and applications. In order to have the appropriate preparation for study in regional planning, entering students should have completed the equivalent of three semesters of college-level courses in the natural sciences involving laboratory or field work, two semesters of calculus, two semesters of statistics, two semesters of economics, and two semesters of political science. Students otherwise qualified may be admitted with deficiencies in these areas. Deficiencies may be removed by passing proficiency examinations or by taking regular undergraduate courses after admission to the program, but courses taken for this purpose will not count toward fulfillment of degree requirements.

The student entering with the baccalaureate degree will be required to complete 24 units of graduate credit, at least 16 of which must be in graduate courses. At least 2 units must be in dissertation credit. The student entering with a master's degree in planning or a closely allied field generally will be required to complete 16 units, at least 8 of which must be in courses. A maximum of 8 units of advanced-standing credit may be granted. The student's program will consist of courses (some required) in planning research methodology, planning theory and application, social science elements of regional planning, natural science elements of regional planning, and electives. The student must pass a written qualifying examination, as well as oral preliminary and final examinations.

Financial Aid. Fellowships, tuition and service fee waivers, teaching assistantships, and research assistantships are available each year. Financial aid is awarded on the basis of the student's previous academic record and other indicators of potential. In the case of assistantships, the possession of specific teaching or research capabilities is a consideration.

Faculty Research Interests. Members of the faculty are engaged in research, public service, and continuing education through the Bureau of Urban and Regional Planning Research. These efforts are undertaken in the areas of land use, economic development, environmental planning, housing, information systems, social planning, transportation, preservation planning, and regional science.

Library Resources. The department has one of the finest planning libraries in the world, with a collection of books and reports developed during the more than seventy years that planning education has been offered at this university.

Computing Resources. The department has an instructional computing laboratory with sophisticated, graphic workstations to support planning decision making.

VETERINARY MEDICAL SCIENCE

Dean of the College of Veterinary Medicine: RICHARD E. DIERKS

The College of Veterinary Medicine is currently realigning the administration of its graduate programs from a single program (Veterinary Medical Science) to three programs corresponding to the academic departments in the college (Veterinary Biosciences, Veterinary Clinical Medicine, and Veterinary Pathobiology). Graduate students are now being admitted directly to one of the three academic department programs.

Veterinary Biosciences

Head of the Department: WILLIAM C. WAGNER

Correspondence and Information: Department of Veterinary Biosciences, University of Illinois at Urbana-Champaign, 3516 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. F. BEVILL, W. B. BUCK, L. E. DAVIS, B. K. GUSTAFSSON, L. G. HANSEN, G. L. JACKSON, R. F. KEELER, G. D. KORITZ, R. S. OTT, A. J. PARKER, A. G. SCHILLER, J. L. SHUPE, E. SMALL, C. W. SMITH, J. C. THURMON, A. R. TWARDOCK, W. C. WAGNER, H. L. WHITMORE

Associate Professors: E. H. HEATH, J. E. HIXON, K. R. HOLMES, T. F. LOCK, M. MANOHAR, M. R. SIMON, D. L. SMETZER

Assistant Professors: R. V. ALLHANDS, V. R. BEASLEY, J. A. DELLINGER, A. S. HASSAN, E. H. JEFFERY, G. J. PIJANOWSKI, D. L. TROYER

Graduate Degree Programs. The Department of Veterinary Biosciences offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Areas of specialization include anatomy, bioengineering, physiology, pharmacology, toxicology, and nuclear medicine. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Biosciences and from other departments of the Graduate College. Laboratory and animal holding space is provided in the Basic Sciences Building, Veterinary Teaching Hospitals, and the Veterinary Research Farm.

Admission. Applicants for graduate study in veterinary biosciences must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire professional curriculum for those with the D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of graduate credit, of which 4 units must be in veterinary biosciences and a minimum of 3 units must be in courses at the 400 level; (2) ¼ unit of veterinary biosciences seminar credit; (3) thesis on original research; and (4) final comprehensive examination.

Doctor of Philosophy. The requirements for the degree include: (1) 24 units of graduate credit, 12 units of which, including thesis research, must be in veterinary biosciences and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary biosciences seminar credit; (3) reading proficiency in one foreign language; (4) passage of departmental qualifying examination; (5) passage of the preliminary examination; and (6) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of research and teaching assistantships or associate positions are available.

Veterinary Clinical Medicine

Head of the Department: BORJE K. GUSTAFSSON

Correspondence and Information: Department of Veterinary Clinical Medicine, University of Illinois at Urbana-Champaign, 244 Small Animal Clinic, 1008 West Hazelwood Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G. J. BAKER, R. F. BEVILL, B. O. BRODIE, L. E. DAVIS, J. L. DORNER, B. K. GUSTAFSSON, L. C. HELPER, R. S. OTT, A. J. PARKER, A. G. SCHILLER, E. SMALL, C. W. SMITH, J. C. THURMON, A. R. TWARDOCK, W. C. WAGNER, H. L. WHITMORE

Associate Professors: G. J. BENSON, A. H. BRIGHTMAN, T. J. BURKE, J. A. DIPIETRO, J. E. HIXON, W. E. HOFFMANN, S. K. KNELLER, T. F. LOCK, M. MANOHAR, B. C. MCKIERNAN, D. R. NELSON, D. L. SMETZER, W. J. TRANQUILLI

Assistant Professors: R. R. BADERTSCHER, D. P. BANE, M. BOERO, K. L. CAMPBELL, T. E. GOETZ, W. F. HALL, A. L. JOHNSON, D. R. KRAWIEC, D. M. MACCOY, D. MCKENNA, S. A. MCLAUGHLIN, G. K. OGILVIE, L. G. WHEATON

Graduate Degree Program. The Department of Veterinary Clinical Medicine offers a graduate program leading to the Master of Science degree. The primary goal of graduate study in veterinary clinical medicine is to prepare the student for a career of research and teaching in a specialty area. Graduate work in veterinary clinical medicine may be pursued in several fields of specialization including anesthesiology, equine medicine and surgery, food animal medicine and surgery, ophthalmology, radiology, small animal medicine and surgery, and theriogenology (animal reproduction).

The student's needs for clinical exposure will vary with the candidate and the candidate's field. Advanced clinical training is required. The clinical training can be organized in different ways depending on the student's course work, teaching duties, and research program. Usually, it will be arranged so that the student takes part in clinical work at the Veterinary Medical Teaching Hospital or in the field.

The department also offers a postgraduate clinical training program (residency) that is designed to provide advanced clinical training usually leading to board certification in a specialty. A residency program must be combined with the graduate program to provide the resident with research training.

Admission. Admission requirements include a Doctor of Veterinary Medicine degree or equivalent. By petition, non-D.V.M. applicants with an equivalent degree or education could be admitted.

Applicants for graduate study in veterinary clinical medicine must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Admission averages are computed from the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire professional curriculum for those with a D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of credit of which 4 units must be in veterinary clinical medicine, veterinary biosciences, or veterinary pathobiology and a miniumum of 3 units must be in courses at the 400 level; (2) ¼ unit of veterinary clinical medicine seminar credit; (3) thesis on original research; (4) final comprehensive examination.

Financial Aid. A limited number of teaching associate positions are available.

Veterinary Pathobiology

Head of the Department: JOHN A. SHADDUCK

Correspondence and Information: Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2522 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R. E. DIERKS, J. L. DORNER, D. H. FRITTS, K. MCENTEE, R. C. MEYER, M. RISTIC, D. SEGRE, J. A. SHADDUCK, J. SIMON, K. S. TODD, JR., W. A. F. TOMPKINS, D. N. TRIPATHY, G. T. WOODS

Associate Professors: L. G. BIEHL, W. M. HASCHEK-HOCK, W. E. HOFFMANN, V. R. IVENS, H. A. REYNOLDS, A. R. SMITH, R. D. SMITH

Assistant Professors: T. A. BERTRAM, S. J. BROWN, H. B. GELBERG, E. C. HAHN, M. S. KUHLENSCHMIDT, M. SEGRE, D. A. STAHL, J. P. SUNDBERG, E. R. VIMR, H. E. WHITELEY, J. F. ZACHARY

Graduate Degree Programs. The Department of Veterinary Pathobiology offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Areas of specialization include epidemiology, immunology, microbiology, parasitology, clinical pathology, and pathology. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Pathobiology and from other departments of the Graduate College.

Admission. Applicants for graduate study in veterinary pathobiology must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire professional curriculum for those with the D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of credit, of which 4 units must be in veterinary pathobiology and a minimum of 3 units must be in courses at the 400 level; (2) ¼ unit of veterinary pathobiology seminar credit; (3) thesis on original research or a publishable manuscript; (4) final comprehensive examination.

Doctor of Philosophy. The requirements for the degree are: (1) 24 units of credit (8 units toward the Ph.D. degree are allowed for an M.S. degree completed elsewhere), 12 units of which (including thesis research) must be in the Department of Veterinary Pathobiology and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary pathobiology seminar credit; (3) reading proficiency in either French, German, Russian, or Spanish (other languages may be approved by petition); (4) passage of the preliminary examination; and (5) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of teaching and research assistantships or associate positions are available.

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Where to Write or Telephone for Information about:

GRADUATE ADMISSIONS INFORMATION AND APPLICATIONS: Graduate and International Admissions, University of Illinois at Urbana-Champaign, 10 Administration Building, 506 South Wright Street, Urbana, IL 61801 (217) 333-0413; or the Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, IL 61820 (217) 333-0035; or the prospective department.

EMPLOYMENT ASSISTANCE: Student Financial Aid, University of Illinois at Urbana-Champaign, 420 Turner Student Services Building, 610 East John Street, Champaign, IL 61820 (217) 333-0100.

FELLOWSHIPS, ASSISTANTSHIPS, AND OTHER FINANCIAL ASSISTANCE: The prospective department.

INTERNATIONAL STUDENTS (PASSPORT, VISA ASSISTANCE): International Student-Staff Affairs, University of Illinois at Urbana-Champaign, 331 Turner Student Services Building, 610 East John Street, Champaign, IL 61820 (217) 333-1303.

HOUSING: Housing Information, University of Illinois at Urbana-Champaign, 2 Turner Student Services Building, 610 East John Street, Champaign, IL 61820 (217) 333-1420.

MOTOR VEHICLE AND BICYCLE REGISTRATION: Campus Parking, University of Illinois at Urbana-Champaign, 505 East Green Street, Champaign, IL 61820 (217) 333-3530.

PERMANENTLY PHYSICALLY HANDICAPPED STUDENTS: Rehabilitation-Education Services, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, IL 61820 (217) 333-4602.

VETERANS' EDUCATIONAL BENEFITS: Veterans Educational Benefits, University of Illinois at Urbana-Champaign, 420 Turner Student Services Building, 610 East John Street, Champaign, IL 61820 (217) 333-0100.

OTHER INFORMATION: Public Affairs, Swanlund Administration Building, 601 East John Street, Champaign, IL 61820 (217) 333-5010.

Reference copies of this publication are available at Illinois public libraries, high schools, and community colleges. Copies of the *Undergraduate Programs, Graduate Programs,* and *Courses* catalogs (the latter briefly describes the content of each course, credit offered, and enrollment requirements) may be purchased at or ordered by mail from the Illini Union Bookstore, 715 South Wright Street, Champaign, IL 61820.

1988-90 Graduate Programs

University of Illinois
at Urbana-Champaign

University of Illinois administrative offices at Urbana-Champaign are open Monday through Friday from 8:00 a.m. to 12:00 noon and 1:00 to 5:00 p.m., except on all-campus holidays which are indicated in the University Calendar.

An information center, available to visitors to the campus, is located in the north entrance lobby of the Illini Union. The center is open from 8:00 a.m. to 8:00 p.m. daily, including Saturdays and Sundays, when classes are in session.

Small group information sessions about the campus are available at the Campus Visitor's Center in Levis Faculty Center, 919 West Illinois Street. Visitors are welcome between 9:00 a.m. and 4:00 p.m., Monday through Friday, excluding campus holidays.

The commitment of the University to the most fundamental principles of academic freedom, equality of opportunity, and human dignity requires that decisions involving students and employees be based on individual merit and be free from invidious discrimination in all its forms, whether or not specifically prohibited by law.

The policy of the University of Illinois is to comply with all federal and state nondiscrimination, equal opportunity, and affirmative action laws, orders, and regulations. The University of Illinois will not discriminate against any person because of race, color, religion, sex, national origin, ancestry, age, marital status, handicap, unfavorable discharge from the military, or status as a disabled veteran or a veteran of the Vietnam era. This nondiscrimination policy applies to admissions, employment, access to and treatment in the University programs and activities.

Among the forms of invidious discrimination prohibited by University policy but not law is sexual orientation. Complaints of invidious discrimination based solely upon policy are to be resolved within existing University procedures.

For additional information on the equal opportunity and affirmative action policies of the University, please contact on the Urbana-Champaign campus: William A. Savage, Assistant Chancellor and Director of Affirmative Action, Swanlund Administration Building, 601 East John Street, Champaign, Illinois 61820, (217) 333-0574.

Information contained herein is for informational purposes only and is subject to change without notice. Individual departments and units should be contacted for further information. Courses, faculty assignments, prerequisites, graduation or completion requirements, standards, tuition and fees, and programs may be changed from time to time. Courses are not necessarily offered each semester or each year. The University retains the exclusive right to judge academic proficiency and may decline to award any degree, certificate, or other evidence of successful completion of a program, curriculum, or course of instruction based thereupon. While some academic programs described herein are designed for the purposes of qualifying students for registration, certification, or licensure in a profession, successful completion of any such program in no way assures registration, certification, or licensure by an agency not the University of Illinois.

1988-90 Graduate Programs
University of Illinois at Urbana-Champaign

(217) 333-0035

The 1988-90 *Graduate Programs* catalog is produced by the Office of Public Affairs/Office of Publications for the Graduate College. The editor for the Graduate College is Margot Jerrard.

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OFFICERS OF THE UNIVERSITY

BOARD OF TRUSTEES

James R. Thompson, *Governor of Illinois, Springfield,* ex officio member

1983-89
William D. Forsyth, Jr., *Springfield*
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1987-93
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In addition to the above, there are two nonvoting student members elected annually.

UNIVERSITY OFFICERS

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Judith Liebman, *Vice-Chancellor for Research*
Stanley R. Levy, *Vice-Chancellor for Student Affairs*

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Judith Liebman, *Dean of the Graduate College and Vice-Chancellor for Research*
Elaine J. Copeland, *Associate Dean*
Dillon E. Mapother, *Associate Dean and Associate Vice-Chancellor for Research*
Eugene Giles, *Associate Dean*
Harvey J. Stapleton, *Associate Dean and Executive Secretary of the Research Board*
Nini Almy, *Assistant Dean and Assistant Vice-Chancellor for Research*
C. Kristina Gunsalus, *Assistant Vice-Chancellor for Research*
Gaye Wong, *Assistant Dean*

ACADEMIC CALENDAR

A Graduate College calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained from the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820

Spring Semester 1988

Jan. 18	M. L. King, Jr., Day (all-campus holiday)
Jan. 20-Jan. 21	Registration
Jan. 25	Instruction begins
Mar. 26 (1 p.m.)-Apr. 3	Spring vacation
Apr. 1	Spring recess (all-campus holiday)
Apr. 4	Instruction resumes
May 11	Instruction ends
May 12	Reading day
May 13-May 20	Final examinations
May 21-May 22	Commencement weekend

Intersession 1988

May 23	Instruction begins
May 30	Memorial Day (all-campus holiday)

Summer Session 1988

June 9-June 10 (noon)	Registration
June 13	Instruction begins
July 4	Independence Day (all-campus holiday)
Aug. 3	Instruction ends
Aug. 4	Reading day
Aug. 5-Aug. 6	Final examinations

Fall Semester 1988

Aug. 22-Aug. 23	Registration
Aug. 25	Instruction begins
Sept. 5	Labor Day (all-campus holiday)
Nov. 23 (5 p.m.)-Nov. 27	Thanksgiving vacation
Nov. 28	Instruction resumes
Dec. 9	Instruction ends
Dec. 10	Reading day
Dec. 12-Dec. 17	Final examinations

Spring Semester 1989

Jan. 16 ..... M.L. King, Jr., Day (all-campus holiday)
Jan. 18-Jan. 19 ..... Registration
Jan. 23 ..... Instruction begins
Mar. 18 (1 p.m.)-Mar. 26 ..... Spring vacation
Mar. 24 ..... Spring recess (all-campus holiday)
Mar. 27 ..... Instruction resumes
May 10 ..... Instruction ends
May 11 ..... Reading day
May 12-May 19 ..... Final examinations
May 20-May 21 ..... Commencement weekend

Intersession 1989

May 22 ..... Instruction begins
May 29 ..... Memorial Day (all-campus holiday)

Summer Session 1989

June 8-June 9 (noon) ..... Registration
June 12 ..... Instruction begins
July 4 ..... Independence Day (all-campus holiday)
Aug. 2 ..... Instruction ends
Aug. 3 ..... Reading day
Aug. 4-Aug. 5 ..... Final examinations

Fall Semester 1989

Aug. 21-Aug. 22 ..... Registration
Aug. 24 ..... Instruction begins
Sept. 4 ..... Labor Day (all-campus holiday)
Nov. 22 (5 p.m.)-Nov. 26 ..... Thanksgiving vacation
Nov. 27 ..... Instruction resumes
Dec. 8 ..... Instruction ends
Dec. 9 ..... Reading day
Dec. 11-Dec. 16 ..... Final examinations

Spring Semester 1990

Jan. 8-Jan. 9 ..... Registration
Jan. 11 ..... Instruction begins
Jan. 15 ..... M.L. King, Jr., Day (all-campus holiday)
Mar. 17 (1 p.m.)-Mar. 25 ..... Spring vacation

Mar. 26 . . . . . Instruction resumes
May 2 . . . . . Instruction ends
May 3 . . . . . Reading day
May 4-May 11 . . . . . Final examinations
May 12-May 13 . . . . . Commencement weekend

Intersession 1990

May 14 . . . . . Instruction begins
May 28 . . . . . Memorial Day (all-campus holiday)

Summer Session 1990

June 7-June 8 . . . . . Registration
June 11 . . . . . Instruction begins
July 4 . . . . . Independence Day (all-campus holiday)
Aug. 2 . . . . . Reading day
Aug. 3-Aug. 4 . . . . . Final examinations

Graduate Education at the University of Illinois at Urbana-Champaign

The University of Illinois at Urbana-Champaign is a leading center for graduate education in the nation. A distinguished graduate faculty of approximately 2,200 members supervises and guides graduate students in research, scholarship, and teaching.

The faculty members of the Graduate College are among the University's most active scholars. These men and women, who have national or international stature as leaders in their fields, work closely with graduate students. More than eighty faculty members have been elected to the American Academy of Arts and Sciences, the National Academy of Sciences, or the National Academy of Engineering. Eight scientists have received the National Medal of Science while on the faculty.

Professor Emeritus John Bardeen won the Nobel Prize in physics twice—the only person ever to do so. Twenty-six faculty members have received the Presidential Young Investigators Award, since it was established by Congress in 1984 to support research by outstanding faculty members near the beginning of their academic careers.

The University is the home of numerous national centers conducting research across many disciplines including supercomputing, engineering, education, genetics, and the arts.

The Graduate College is an administrative unit which has jurisdiction over all programs leading to advanced degrees. The Graduate College develops and safeguards standards of graduate work and promotes and assists research by faculty members and graduate students in all fields.

The University of Illinois was founded in 1867 as the land grant institution of the State of Illinois. In the 120 years since its founding, the University has become an institution of international stature. Scholars and educators rank it among the world's great universities. It is recognized for the excellence of its academic programs and its research, as well as for the outstanding facilities and resources available to students and faculty.

THE CAMPUS

Located in the adjoining cities of Urbana and Champaign (population 100,000), the University and its surrounding communities offer a cultural and recreational environment ideally suited to the work of a major research institution. The University is approximately 130 miles south of Chicago, which is easily reached by air, bus, car, or rail. Ready access to major cities on both coasts through daily flights to and from the University's Willard Airport make

it possible to maintain the close contact with major cultural centers that are essential to the intellectual life of an international university.

The University is a residential campus of classrooms, laboratories, libraries, residence halls, and recreational and cultural facilities with 200 major buildings on the central campus of 705 acres. Nearby are the University's 1650-acre Willard Airport; Robert Allerton Park, the campus's 1,768-acre nature and conference center; and 2,400 acres of agricultural land. There are also 3,700 acres of farmland elsewhere in Illinois which are used by the College of Agriculture as experimental fields.

Nearly every facility on campus is accessible to the physically disabled, and the University's programs and services for the disabled have served as a model worldwide.

GRADUATE DEGREES

The University of Illinois at Urbana-Champaign enrolls 9,000 graduate and professional students and offers advanced degrees in more than 100 fields of study. In addition to the M.A. or M.S. and Ph.D. degrees offered in many disciplines, a number of departments offer work leading to other graduate degrees. Among these are master's and doctoral degrees in professional and performing arts fields and various master's degrees in teaching.

Descriptions of these degrees are given in the appropriate departmental sections of this *Graduate Programs* catalog. More detailed descriptions of graduate programs and the requirements for the degrees may be obtained from the individual departments.

Graduate Research and Instructional Resources

The University of Illinois at Urbana-Champaign is a comprehensive graduate institution. A distinguished graduate faculty, outstanding research facilities, one of the top-ranked libraries in the nation, and superior computer facilities make the Urbana-Champaign campus a stimulating environment for graduate study and research.

The following pages describe some of the facilities and resources available to graduate students and faculty in the ten broad fields of study—agriculture, applied life studies, commerce and business administration, communications, education, engineering, fine and applied arts, law, liberal arts and sciences, and veterinary medicine. The instructional and research programs of individual departments and of interdisciplinary and other graduate units are described in the Programs of Study section of this catalog.

UNIVERSITY LIBRARY

The University Library's resources for advanced study and research are exceptional. It is the third largest academic library in the nation with more than 11 million items, including over 7,190,000 volumes, 515,000 pamphlets, 522,000 maps and aerial photographs, 900,000 music scores and parts, and 3,064,400 micro-texts. In addition, the library receives more than 93,000 periodicals, serials, and newspapers. This wealth of material is housed in the Main Library (4,100,000 volumes in the book stacks) and thirty-eight departmental libraries at various locations about the campus.

Outstanding collections have been developed in a number of areas. In the humanities: classical literature and archaeology; English literature of the sixteenth through the twentieth centuries; Romance and Slavic literature; German literature of the sixteenth and seventeenth centuries; American humor and folklore; and comparative philology. In the fine arts: architecture; landscape architecture; and music. In the social sciences: history of the western United States; Abraham Lincoln and the Civil War; Latin America of the Revolutionary period; the Slavic countries; Ireland; medieval and modern Europe; international law; labor and industrial relations; and political science. In the sciences and technology: agriculture; biological sciences (especially entomology, ornithology, and parasitology); chemistry; geology; mathematics; and physics.

The Rare Book and Special Collections Library houses a superior collection of more than 200,000 volumes, including more than 1,000 incunabula. The collection has three major areas of strength: English history and literature, the history of geology, and the emblem book collection. The Milton collection is the finest in the world, including more than 400 different editions of his works published during the seventeenth and eighteenth centuries. The oldest

printed book is a 1455 copy of the Book of Genesis of the Gutenberg Bible; the most valuable is the Audubon Folio on permanent display. The catalog of the Rare Book and Special Collections Library collection containing acquisitions through 1978 has been published.

The completeness of the bibliographic and reference facilities makes any sort of research possible. In addition, interlibrary loan service is provided for materials not available in the library.

CENTER FOR ADVANCED STUDY

The Center for Advanced Study, a special academic unit of the Graduate College, provides released time for faculty recognized for excellence in scholarship and creative achievement to expand their professional capabilities and to develop new research initiatives. The Resident Studies Program of the center is aimed at generating new programs and enhancing collaboration across departmental and institutional boundaries on issues of importance to the campus and society at large.

The center also administers the activities of the George A. Miller programs. The Miller Endowment Committee each year invites distinguished men and women to the campus as Miller Visiting Professors and younger persons of promise as Miller Visiting Scholars. The Miller Lecture Committee annually sponsors the MILLERCOMM series of lectures, concerts, performances, and other events of broad cultural interest.

RESEARCH SERVICES OFFICE

The Research Services Office (RSO) is a unit of the Office of the Vice-Chancellor for Research. Created in 1979, RSO collects and disseminates information on sponsors that support research and scholarly activities.

Faculty, staff, and students on the Urbana-Champaign campus can use the following RSO resources: current literature on over 5,000 research and scholarship sponsors, reference publications, telephone directories of federal agencies, and handouts spanning topics from proposal preparation to University of Illinois at Urbana-Champaign rules and regulations pertaining to research.

The Illinois Research Information System (IRIS) database is available to identify potential sponsors for faculty, staff, and graduate student research; teaching; travel; equipment; advanced study; and other activities. IRIS contains information on more than 5,000 sponsors, including federal agencies, private and corporate foundations, and other organizations which support research and scholarship activities.

BECKMAN INSTITUTE OF SCIENCE AND TECHNOLOGY

The Beckman Institute, now being built on north campus, is designed to facilitate interaction between researchers in the biological and the behavioral sciences, the physical sciences and engineering. The aim is to link the efforts of researchers in many disciplines who are engaged in the quest of a better understanding of human and artificial intelligence.

Research will be organized along two parallel lines. One will focus on the areas of biology, and will range from the most fundamental questions at the atomic and molecular level through cognitive science. The other in engineer-

ing and physical sciences will concentrate on materials science, computers, and computation.

The Beckman Institute will provide the structure, support, space and intellectual commitment to promote teamwork of researchers in the different fields who will be focusing on the concept of "intelligence." The institute's excellent facilities will be available to University faculty and their research groups, including their graduate students.

NATIONAL CENTER FOR SUPERCOMPUTING APPLICATIONS

The National Center for Supercomputing Applications (NCSA), a special unit of the Graduate College, is one of five centers funded by the National Science Foundation (NSF) in February 1985 to start a new national supercomputing program for university researchers. The NCSA is developing a comprehensive computing environment, currently centered on a CRAY X-MP supercomputer, to support the research and educational needs of the national user community. Use of the NCSA systems is awarded either by the NSF or through the NCSA Peer Review Board. A graduate student can gain access through his or her adviser or a group that has been allocated time on the system.

The NSF placed the new national centers in major research universities to provide a fertile ground for the multidisciplinary interactions needed to create new fields in computational science. The University of Illinois at Urbana-Champaign has founded an Interdisciplinary Research Center (IRC) within the NCSA to focus this process. The IRC is a new type of scientific institute built around a comprehensive, integrated computational network that facilitates frontier research and the sharing of knowledge across disciplines.

The IRC houses a diverse mix of researchers drawn nationally from the physical, engineering, social, and life sciences. These researchers work together with computer scientists and computer professionals. The center does not directly fund research projects but provides the environment in which they can be carried out effectively. The center is a training ground for graduate students working on IRC-affiliated projects. Training includes not only the use of the supercomputer but also the use of workstations and of productivity software for research purposes. In addition, the center sponsors many educational activities open to the entire University community, such as seminars and technology demonstrations.

The NCSA approach is to develop a computing system based on proven technologies, while providing an upgrade path to keep the system at the state-of-the-art. In keeping with this approach, the system is based on the CRAY X-MP series of supercomputers, running the interactive operating system, CTSS. The center currently has a CRAY X-MP/48 with four processors and 8 million words of memory. Coupled to the CRAY is a solid-state storage device (SSD) that provides 128 million words of very high speed solid state memory that is accessed as disk files. A substantial amount of magnetic disk memory is also available. This system is networked at 50 megabits per second to a 55-gigabyte mass storage system and various high-quality output devices. The CRAY X-MP/48 is expected to be upgraded in 1989 to a X-MP 832. This machine is a step in the plan to have continuing upgrades.

The Interdisciplinary Research Center of the NCSA has state-of-the-art workstations designed to meet the needs of different researchers. Low-end workstations can be used for preparing programs for submission to the CRAY, for displaying results from the CRAY, for preparing documents, and for communication with other users. High-end workstations with high-resolution

color displays, a variety of languages and programming tools, mathematical and statistical packages, and general and engineering graphics software can be used for sophisticated pre- and post-processing. This networked workstation environment is designed to enhance research productivity and to give faculty and students experience with state-of-the-art tools and techniques in computing.

CENTER FOR SUPERCOMPUTING RESEARCH AND DEVELOPMENT

The Center for Supercomputing Research and Development (CSRD), established in late 1984, is a special unit of the Graduate College. CSRD is involved with advancing the state of supercomputing in three areas: (1) engineering and architecture, (2) software, and (3) algorithms and applications. CSRD's goal is to demonstrate that supercomputers of the future can exhibit efficient, general-purpose behavior and be easy to use. Activities are based on the algorithm, architecture, and software work conducted at the University of Illinois at Urbana-Champaign for the past fifteen years.

Basic research and development at CSRD is focused on the Cedar system, a prototype large-scale multiprocessor that is being built at the center. Cedar will be used to explore multiprocessor performance, develop software to exploit shared-memory multiprocessors effectively, and provide high performance over a wide range of applications.

Engineering and Architecture

In the realm of engineering and architecture, methods are being developed to construct a communication structure (switch) that can support the data transfer, interprocessor communication, and process synchronization requirements of a large-scale multiprocessor. To support a very large number of fast processors, the communication structure must be scalable technologically and architecturally. Research will also be conducted to determine optimal methods by which the control of a multiprocessor can be fully distributed (global). A third major area of research involves the development of the most appropriate methods for synchronizing processes, processors, tasks, and computations for a variety of specific applications.

Software

Extensive experimentation into compilation techniques for a vector/multiprocessor are continuing at CSRD. The Parafrase System, which provides automatic vectorization and multiprocessing of programs, has been implemented. Software research is also continuing in the management of cache and virtual memory in multiprocessors. By separating "safe" memory accesses from those that would cause cache incoherence, and restructuring the program to minimize "unsafe" references that would bypass the cache, the project is designed to demonstrate that a significant advantage can still be gained from the use of caches. Another focus of software investigation will address operating system problems, such as scheduling and queue access, which can result from the use of a large number of processors.

Algorithms and Applications

Numerical algorithms for solving important problems in nuclear reactor safety

studies, such as obtaining energy by controlled fusion, atmospheric modeling, and hydrodynamic simulation, have taxed the capabilities of existing computers to the limit. The availability of vector machines such as the CRAY and Cyber 205 resulted in some speedup, but for many applications it has not been substantial. At CSRD the foundation has been laid for the development of basic multiprocessor algorithms that are counterparts of well-developed and well-understood sequential algorithms. Cedar will provide the opportunity to understand the limitations of certain algorithms as the number of processor clusters increases and will assist in the development of algorithms that are more suitable for massive parallelism.

COMPUTING SERVICES OFFICE

The computing Services Office (CSO) on the Urbana-Champaign campus provides computer support for instructional and research programs throughout the University. CSO supports two main operating systems, VM/CMS and UNIX, which run on IBM, CONVEX, Gould, Pyramid, Sequent, and DEC machines. These machines are interconnected and serve a network of remote facilities, public terminal sites, graphic equipment, and dial-up terminals.

Members of more than 100 University departments use CSO facilities. The graduate curricula are heavily dependent on computing support, and a large percentage of thesis research requires some computer use. Approximately two-thirds of the utilization is related to graduate programs and research. Areas of strength include computer music and computer art, in addition to computer use in more quantitative disciplines.

Administration of computing facilities is guided by the principle that users should have easy access to computer support. Access to CSO's systems is provided through formal allocations for courses and research and through a "limited free access" policy for students. In addition to its own facilities, CSO arranges access to other computing facilities within the University.

The University owns a vast array of computer resources, including personal computers, minicomputers, mainframes, and a supercomputer. This equipment is supported by UIUCnet, a hierarchical network consisting of a large asynchronous terminal network (about 2000 ports on a Sytek LocalNet broadband network, dial-up lines and ports on a Gandalf switch), a 50 megabit HYPERchannel network, several in-building ethernets, and an optical fiber, token ring backbone network. The UIUCnet delivers basic services—electronic mail, file transfer, access to remote networks, and access to the library card catalogue—at a variety of speeds. The Sytek network provides 9600 baud service to any location reached by the campus broadband cable (some 200 buildings), and ProNet 80 (80 megabits per second) provides a high performance backbone network.

Standard hardware components based on national standards have been used, providing a firm basis from which to build a ubiquitous campus network. In conjunction with the University's project to install a telephone switch, universal office wiring for low speed data over copper, universal building wiring for medium speed data and video over coaxial cable, and universal wiring for high speed networks over fiber have been installed. The current configuration includes 34 nodes on the backbone, 110 networks, more than 600 hosts, and thousands of users. Access is provided to the internet of networks that runs the Transmission Control Protocol/Internet Protocol (TCOP/IP) and to the networks using DECnet. TCP/IP and DECnet are supported

simultaneously on the backbone.

CSO offers a full complement of computer-related user services, including consulting on systems, microcomputers, software packages, and hardware. Support services in hardware maintenance and text processing are also available on a limited basis. Short courses and seminars are taught by the consulting staff. A Microcomputer Resource Center is available where users may "try out" various software packages and microcomputers or may copy free public-domain software.

The main facility, CSO North, is situated in the Digital Computer Laboratory and houses the various computers and most of the CSO offices.

The Systems Consulting Office and the Accounting/Distribution Office are located at 1208 W. Springfield, Urbana. The Systems consultants offer a wide range of services on a walk-in/phone-in basis. The Accounting/Distribution Office provides access to the various machines, as well as documentation on their usage.

A second facility, CSO South, is situated in the Commerce Building (West). It houses an IBM 4341 and is a major site with microcomputers and terminals connection to other CSO systems. The Statistical Consulting Office and the Microcomputer Consulting Office are also located in Commerce West.

Other public sites are located in Mechanical Engineering, Lincoln Hall, Psychology, Turner Hall, Noyes Laboratory, several residence halls, and the Illini Union.

The long tradition of computer use at Illinois has led to widespread strength both within CSO and across the campus.

COMPUTER-BASED EDUCATION RESEARCH LABORATORY

PLATO, a unique computer-based educational system, was developed in the Computer-based Education Research Laboratory (CERL) on the Urbana-Champaign campus. PLATO is an interactive, time-sharing system whose computers control 1,500 terminals situated throughout the country. Two Cyber 170-series computers, each with 131,000 sixty bit words of central memory, are the heart of the system. The system also includes 4 million words of extended memory (40 million characters), plus approximately 3.5 billion characters of permanent storage available to users at any time.

CERL also cooperates with faculty in many departments who wish to develop courseware for the system and to incorporate it in their instruction. There are approximately 400 PLATO terminals on the Urbana-Champaign campus, more than 250 of which are available for student use. Individualized instruction on the PLATO system with immediate and rapid feedback is offered in many campus courses for undergraduate and graduate students. Lessons now exist in more than 100 subjects. The PLATO system also plays a role in the recreational life of the campus with its variety of interesting games and is a fascinating communication device providing electronic mail service and immediate message exchange between users. At least 8,000 students per semester are involved with PLATO.

The original PLATO terminals used plasma panels for visual display. Several kinds of computer terminals, including PC's, are now used to access the CERL PLATO system. The plasma panels and the computer-to-terminal communication scheme were developed at CERL, as were the terminals and other devices such as touch panels and audio. Although the computers are dedicated to educational use and provide teaching facilities for over 1 million hours of

student and author use per semester, hardware and software research continues in the laboratory. Opportunities are available for research in designing terminals and communication devices, as well as in developing the delivery of PLATO materials to cable television and to recent system configurations. New systems include a Cluster system and the new super-sized, more affordable version of the PLATO system, NovaNET, both of which are now operable. NovaNET offers innovative, technical features such as a new high-speed low-cost central processor capable of handling several thousand terminals per system, and a variety of communication options to meet user needs including satellite data transmission.

In addition to the University of Illinois at Urbana-Champaign PLATO system, there are many other PLATO systems not only in the United States, but worldwide. Lessons for the PLATO systems are transferable from one system to another. The courseware is written in TUTOR, a powerful and efficient language originally created for the CERL PLATO system, which allows text and graphic designing, programming, and testing of lesson materials by the authors directly at their terminals. The PLATO computers are dedicated to teaching, but the system is also used for scientific computation, information retrieval, word processing, data processing, and personal services.

BIOTECHNOLOGY CENTER

The Biotechnology Center, a special unit of the Graduate College, is an organization of eighty-five members of the Urbana-Champaign campus from more than a dozen disciplinary departments who have active research programs that span a broad range of biotechnology research areas. The center supports an expanding industrial affiliates program which promotes interaction between faculty and scientists in industrial research settings.

The Biotechnology Center administers four centralized service facilities: the Genetic Engineering Facility, the Cell Science Laboratory, the Molecular Graphics Facility, and the Fermentation Facility. The Genetic Engineering Facility synthesizes peptides and DNA oligonucleotides and performs protein sequencing and amino acid analysis for faculty and for industrial affiliates. The Cell Science Laboratory has a hybridoma facility for making monoclonal antibodies and a flow cytometry facility with three state-of-the-art fluorescence-activated cell sorters. The flow cytometers are available to all faculty members and graduate students for use in conjunction with their research efforts. A full-time operator is available to run samples and to train staff in the use of these sophisticated instruments. The Molecular Graphics Facility has a Silicon Graphics IRIS Workstation with several sophisticated software programs for the display and manipulation of macromolecules. The Fermentation Facility is supervised by a trained chemical engineer who operates 20-, 30-, and 200-liter fermenters for the growth of large quantities of microorganisms.

The Biotechnology Center has supported interdisciplinary graduate courses and workshops in biotechnology and organizes an annual conference on biotechnology research held each spring on the Urbana-Champaign campus.

COMPOUND SEMICONDUCTOR MICROELECTRONICS LABORATORY

The Compound Semiconductor Microelectronics Laboratory is a major edu-

cational and research effort in the College of Engineering. It provides for the cross-disciplinary investigation of new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors. The laboratory is supported by numerous grants from industry and government, including a major five-year grant from the National Science Foundation for an Engineering Research Center for Compound Semiconductor Microelectronics. The NSF-sponsored program focuses on the investigation of optical interconnect technologies to eliminate the bottleneck of metal interconnects in high-speed digital systems, with the special goal of triggering the development of new technologies by industry. The cross-disciplinary program is aimed not only at research, but also at the education of undergraduate and graduate students in the most advanced concepts and practices in microelectronics.

The laboratory includes four special groups of facilities: facilities for artificially-structured materials, including MBE and MOCVD epitaxial growth; facilities for submicron device fabrication, including electron beam and optical lithography, plasma-assisted deposition of oxides and nitrides, reactive ion etching, and plasma etching; a facility for ultra-high-speed optical and electrical measurements; and facilities for characterization of ultra-high purity semiconductors.

A new building is under construction to house the Microelectronics Lab, including the NSF-funded Center with its research, educational, and industrial outreach programs. Construction of the $13.5 million dollar, 50,000-square-foot building is targeted for completion in 1989.

AGRICULTURE

The College of Agriculture is recognized throughout the world for the excellence of its research and the innovations this work has brought about. For more than 120 years the college has helped to improve commercial agriculture and also to protect the environment, preserve our natural resources and to better the quality of life in both home and community. Much of the work of the college involves searching for solutions to specific problems and opening new opportunities to transfer this knowledge to those who can use it in all parts of society and the world. The college has active programs in four broad areas—teaching; research; extension education and public service; and international agriculture. The college includes the School of Human Resources and Family Studies with four divisions, Family and Consumer Economics, Foods and Nutrition, Human Development and Family Ecology, and Textiles, Apparel and Interior Design; the Division of Nutritional Sciences; and the Departments of Agricultural Economics, Agricultural Engineering, Agronomy, Animal Sciences, Food Science, Forestry, Horticulture, and Plant Pathology. Students can also choose graduate programs in Agricultural and Home Economics Education. Approximately 10,000 acres of college farmland in all parts of Illinois are used for experimentation. In the college there are currently 986 academic and professional staff members.

Programs for graduate students in the various units are described in their sections later in this catalog. Approximately 300 College of Agriculture faculty members belong to the Graduate College. About 650 graduate students register each year for work in the college, and approximately 60 Ph.D. and 130 M.S. degrees are conferred annually.

Graduate students are an integral part of the research conducted through the Agricultural Experiment Station. Because research often involves more than one field of study, much of it is conducted in cooperation with other colleges on the Urbana-Champaign campus, with the state surveys situated on the campus (Geological, Natural History, and Water), with the U.S. Department of Agriculture, and with other agricultural colleges. Interdisciplinary research is encouraged in such special areas as crop and animal production and uses, environmental quality, pest management, the International Soybean Program (INTSOY), and food and nutrition. Financial support for research comes from appropriations by the State of Illinois, from federal appropriations and contracts, from international agencies, and from private gifts and fellowships.

Illinois education, agriculture, and agribusiness are in the forefront of world food production and development. In the future, many students will go into the world employment market, directly or indirectly, even if they live and work in the United States. Several courses in the departments of the college emphasize international agriculture; research is conducted with the goal of assisting developing countries to expand their own food production and distribution. Faculty exchanges and cooperative research with foreign institutions and agencies offer opportunities for mutually beneficial programs. The broad supervision of the college's international activity is in the Office of International Agriculture. Some major international interests in the College of Agriculture include soybeans, maize, animal agriculture, and nutrition.

The college's extension education work is through the Cooperative Extension Service, which has a staff of state, regional, and county specialists in 110 offices throughout the state. The Cooperative Extension Service has 482 academic and professional staff members and about 421 paraprofessionals and other support personnel.

The Agricultural Experiment Station coordinates the college's research program. The majority of the staff of 155 professional scientists, 307 professional workers, 115 technicians, and 157 other workers also have assignments in one of the other program areas of the college. There are approximately 400 active projects in the station being conducted on campus and at one of the 15 research centers throughout the State of Illinois.

APPLIED LIFE STUDIES

There are three departments in the College of Applied Life Studies: Health and Safety Studies, Kinesiology, and Leisure Studies; two divisions, Campus Recreation and Rehabilitation Education (see Resources, Facilities, and Services); and an interdisciplinary research unit, the Institute for Research on Human development.

The Department of Health and Safety Studies promotes human health and safety through research, instruction, and service. Its programs enable graduates to undertake research in health and safety education, community health development, health services, health policy, health behavior, safety factors, and epidemiology and to serve as professionals in the health field on the state, national, and international level.

Research facilities in the department include a general-purpose resource laboratory, a multiple-car driving range, and community-based field sites.

The Department of Kinesiology focuses on the study of human movement and physical activity. The academic teaching and research programs are concerned with humans as physically active organisms, with special reference to

the components, determinants and development of movement patterns in action, together with the impact that engagement in physical activities has on individuals, societies, and cultures. Human movement is studied in terms of diverse forms of motor behavior and motor skills found within a wide range of physical activities, including athletic training, dance, exercise, physical recreation, sport, and work. The graduate programs (M.S., Ph.D.) of Kinesiology are organized around three areas that relate to the study of human movement: 1) biodynamics of physical activity; 2) coordination, control, and skill; and 3) social science of physical activity. There are also professionally oriented master's degree programs in pedagogical kinesiology (M.S.T.) and therapeutic kinesiology (M.S.). The graduate programs provide the scholarly basis for a variety of careers for kinesiologists in the performing arts, education, health related fields, industry, the military, and sport.

The Department of Leisure Studies focuses on our understanding of leisure behavior and the quality of leisure service delivery systems. Areas of research and teaching include leisure service administration; recreation resource management; therapeutic recreation; and the sociology, psychology, and anthropology of leisure. The Leisure Behavior Research Laboratory is a departmental unit whose mission includes research on leisure behavior from disciplinary perspectives. The Office of Recreation and Park Resources, which is merged with the Cooperative Extension Service of the College of Agriculture, offers consulting services and continuing education and serves as a laboratory for carrying out research on recreation programs throughout the state.

The Institute for Research on Human Development is an interdisciplinary research unit concerned with health and human development, directed toward understanding and promoting optimum health, human development, and performance. It has an established national reputation for its work in a number of areas including gerontology, motivation, psychopharmacology, and performance assessment. Institute programs are characteristically undertaken in cooperation with other University departments such as Human Development and Family Ecology, Health and Safety Studies, and Rehabilitation Education.

Within the Institute for Research on Human Development, the Office of Gerontology and Aging Studies serves the campus as an information center for gerontology and to support undergraduate specialization in gerontology that has been inaugurated by several departments. The main aim of the office is to stimulate and facilitate research on aging from the many disciplines and programs with potential for funding in this area. The long term goal of the office is to develop a viable gerontology program for the UIUC campus in collaboration with other university programs and state agencies.

COMMERCE AND BUSINESS ADMINISTRATION

The College of Commerce and Business Administration is a leader in business education. One of the original units when the University of Illinois began in 1867, the college has consistently rated in the top ten nationally for the quality of its programs and the scholarship and teaching excellence of its faculty.

The college offers graduate work in its top ranked Departments of Accountancy, Business Administration, Economics, or Finance. In addition to the masters or doctoral degree programs in these four departments, students may choose to work toward professional degrees, the Master of Accounting Science (M.A.S.), Master of Business Administration (M.B.A.), the Executive M.B.A.,

Master of Science in Policy Economics (M.S.P.E.), or the Master of Science in Business Administration (M.S.B.A.).

Joint degree programs include the J.D. and M.A.S., M.A.S. and Bachelor of Arts in Liberal Arts and Sciences, M.A.S. and Bachelor of Science in Computer Science, J.D. and M.B.A., M.B.A. and Master of Architecture, M.B.A. and Master of Computer Science, M.B.A. and Master of Science in Electrical Engineering, M.B.A. and Doctor of Medicine, M.B.A. and Bachelor of Arts in Liberal Arts and Sciences, M.B.A. and Master of Arts in Public Administration, M.B.A. and Master of Industrial Engineering, M.B.A. and Master of Mechanical Engineering, and M.B.A. and Master of General Engineering.

Although the lecture-discussion form of teaching is widely used in the college, the faculty utilizes a variety of other resources. Organization theorists use the Behavioral Laboratory for evaluating the small-group–decision-making process. The computer is widely used in teaching accounting, statistics, finance, and operations research. Many cases and simulation programs and games in business administration and finance courses depend on the computer to generate analytical information. Also, many courses involve students in writing computer programs or using the large library of computer programs for research.

An important development in the college is the new Office of Information Management, financed jointly by a grant from the IBM Corporation, college and university funds, and other corporate donations. The major goal of the office is to coordinate the development of computer applications in the course curriculum, to supervise computer laboratories used for general student projects which simulate specialized business information system environments, and to provide a focal point for research related information systems and their impact on management and its operations. The facilities and activities of the office permit the college to give students experience in state-of-the-art equipment and programs in information systems.

Faculty and students rely heavily on the outstanding University Library, which has a large collection of books, reference documents, serials, periodicals, and company data. The Executive-in-Residence Program and the Executive Lecture Series bring visiting business executives to the campus to present lectures and lead discussions on specific topics.

The Bureau of Economic and Business Research provides and analyzes a variety of state and local economic data. The college has acquired several financial data files such as the Chicago Research on Stock Prices (CRSP), and the Standard and Poor's Compustat Tapes. There are also economic data tapes, including Data Resources and International Monetary Fund tapes, and the college is the depository for the Bureau of Economic Analysis tapes and diskettes.

Another important aspect of the college's overall teaching and research program is the international orientation of many programs. Distinguished faculty members with international academic backgrounds have developed a number of special courses with an international focus. The Office of the Coordinator of International Programs in the college provides overall assistance in the international field. The Center for International Education and Research in Accounting in the Department of Accountancy coordinates the research programs of distinguished visiting scholars and publishes an international accounting journal. The college is involved in several overseas international programs, including programs in Bangladesh, Saudi Arabia, the Sudan, and elsewhere. A Program in Policy Economics has been started in the Department of Economics for people from developing countries, and the Department

of Business Administration offers a unique 14-month Master of Science in Business Administration for International Managers.

The Office of Real Estate Research, funded by the State of Illinois Real Estate Recovery Fund, undertakes and fosters research related to real estate in Illinois, communicates the results of such research to the real estate industry, and promotes the ongoing development of real estate education.

Three new research offices have been created in the college. They are: the Office of Public Utility Research; the Office of Accounting Research; and the Office of Innovation, Entrepreneurship, and Economic Development. Each of these offices promotes and coordinates research of faculty members in the college in these specific areas. In addition, each office provides a focal point for the college and its various constituencies to discuss and disseminate research results. These offices are funded by a combination of government and private industry support.

The Survey Research Laboratory is widely used by faculty and students interested in survey work. The Behavioral Laboratories are used to perform a variety of behavioral experiments, and the computer is a major tool for hypothesis testing and programming.

COMMUNICATIONS

In the College of Communications, the Institute of Communications Research, which administers the doctoral program in communications, is one of the oldest and most distinguished interdisciplinary research centers in the United States. The institute, through its graduates, has spawned many similar programs and institutes around the country. It conducts research and teaches in virtually all areas of communication but concentrates on cultural and media studies, the political economy of communications, the effects of mass communication, attitude and opinion change, and the psychology and sociology of language. It provides students the opportunity to study and to conduct research with a faculty that joins such disciplines as political science, sociology, psychology, and linguistics with the professional fields of advertising, broadcasting, and journalism. The University broadcasting division, which operates WILL-AM-FM-TV, provides equipment and studios for broadcast instruction. The college also maintains laboratories for audio production, typography, and photography. Holdings in the Communication Library in Gregory Hall are widely regarded as the best in the nation.

EDUCATION

The College of Education is recognized worldwide for the excellence and leadership of its faculty, graduate programs, and alumni. During the past decade, the college has consistently been rated among the top five colleges of education in the nation. Its faculty have served as executive officers of nearly every professional education organization and also have held editorial and review positions on most educational journals. Seven major professional journals are currently published under the auspices of the college. Typically, more than forty percent of the college's budget results from externally funded research.

College alumni are found in faculty and administration positions in the leading colleges of education throughout the world. Additionally, alumni hold

numerous leadership positions in government education agencies and school districts.

Graduate programs are offered in all of the academic departments: Administration, Higher, and Continuing Education; Educational Psychology; Elementary and Early Childhood Education; Educational Policy Studies; Secondary Education; Special Education; and Vocational and Technical Education.

The Department of Administration, Higher, and Continuing Education has three divisions that offer research and professional programs with humanistic and social science foundations and theoretical and practical perspectives. The Division of Educational Administration and Supervision emphasizes scholarship and research in areas such as school law, supervision and evaluation of instruction, school finance, politics of education, the nature of school excellence, and administrative theory. The Division of Higher Education prepares degree candidates for administrative positions in community and senior colleges, universities, and related agencies. It provides specializations in the administration of higher education, student development, student affairs, and the history of higher education. Persons enrolled in the Division of Continuing Education are prepared for administrative positions in a variety of continuing education agencies concerned with professional development.

The Department of Educational Psychology serves two primary interrelated functions. The first is to promote both basic and action-oriented psychological and other types of research on questions related to broadly used educational practices and policies. The second is to train practitioners; this includes inservice and preservice instruction and consultation. Graduate degrees are offered in areas covered by its five divisions: Counseling Psychology, Developmental and Socialization Processes, Learning and Instruction, Quantitative and Evaluative Research Methodologies, and Sociocultural Perspectives in Education. Also, a master's degree can be earned in a general educational psychology program. The Ph.D. program in Counseling Psychology has APA accreditation. The department has a national and an international reputation as a research and educational center.

The Department of Educational Policy Studies is composed of three divisions: History of Education, Philosophy of Education, and Comparative Education and Social Science. The department offers programs for training scholars, teachers, and educational policy analysts. The programs provide a basis for analysis and evaluation of educational theory, practice, and policy within the intellectual and empirical contents of history, philosophy, and the social sciences.

Graduate degree programs in the Department of Elementary and Early Childhood Education are designed to meet the individual needs of college graduates who are prospective or experienced teachers, administrators, researchers in teacher education, or consultants working in the field of education. Areas of graduate specialization include Early Childhood Education, Elementary Education, Curriculum, Language Arts, Mathematics and Cognitive Development, Literacy and Language Education, Science, Social Context of Education, Social Studies, Teacher Education, and Bilingual Multicultural Education. Students work closely with faculty members who have national reputations in research, development, and scholarship.

The Department of Secondary Education offers teacher-certification programs in the areas of English, mathematics, science, and social studies and a teacher education minor in computer-assisted instruction. Programs in these areas, as well as in curriculum, curriculum and instruction, and teacher edu-

ation are offered at all levels of graduate study. There is also an Ed.D. program in music education.

The Department of Special Education offers graduate programs to prepare teachers, supervisors, and administrators of special education for exceptional children, youth, and adults in public and private agencies. At the doctoral level, leadership personnel are prepared for teacher education, research, and administrative positions in university settings and local, state, or national agencies serving handicapped or gifted individuals.

The mission of the Department of Vocational and Technical Education is reflected in its goals: (1) to prepare and upgrade personnel to serve as researchers, teacher-educators, and administrators; (2) to maintain a program of disciplined inquiry, which generates and disseminates new knowledge designed to improve educational practices; and (3) to provide professional services to the department, the University, schools, professional organizations, governmental agencies, and other public and private organizations at local, state, national, and international levels. The programs available in the department are Agricultural Education, Business Education, Home Economics Education, Technology Education, and General Vocational Education.

In addition to research conducted principally within academic departments, the following units, with specialized research interests, are supported by the college: the Bureau of Educational Research, the Center for Instructional Research and Curriculum Evaluation, the Center for the Study of Reading, the Office of Educational Policy Research, the Office of International Programs in Education, the Office of Multicultural Bilingual Education, the Office for Career Development for Special Populations, the Office of Vocational Education Research, and the Secondary Transitional Intervention Effectiveness Institute. Most of these units offer assistantships or fellowships to qualified doctoral students.

ENGINEERING

One of the original units of the University when it was founded in 1867, the College of Engineering is recognized as a major international center of excellence in graduate education in scope, quality, and productivity. In overall quality, the college has been among the top four in the nation in all surveys of recent years. The College of Engineering leads the nation in total degrees conferred at all degree levels; in recent years, one out of every twenty Ph.D. graduates in engineering received his or her degree from the University of Illinois at Urbana-Champaign.

The college's Engineering Experiment Station, organized in 1903 as the first of its kind, had separately budgeted research expenditures in the 1986 fiscal year of $57 million. Special laboratories and unusual facilities such as the nuclear reactor, radio and optical telescopes, AVCO HPL-10 20-kW industrial laser, and an 80-kW plasma spray unit are available.

University computer services are provided by a number of general-purpose computers: a CDC CYBER 175, an IBM 3081, a Gould, a Sequent, three Pyramids, an IBM 4341, and several VAX 11/780s. In addition to these central facilities, there are thousands of personal computers and a number of minicomputers and mainframes supported by individual departments. The college also operates an IBM 4381 for CAD/CAM applications. This vast array of computing resources is supported by a hierarchical network consisting in part of a large (2000 port) asynchronous terminal network and an optical

fiber token ring backbone network. In 1987 the college installed an 80-megabit/second backbone network to connect 23 major college buildings to the campus network, giving faculty and students access to all central computing facilities, to the 110 attached local area networks, and to a number of regional and national networks such as ARPAnet, BITnet, and NSFnet.

The Engineering Library holds 180,000 volumes and more than 3,600 periodical subscriptions. The remainder of its 350,000-volume collection is found in other campus locations. The Engineering Library is supplemented by a series of departmental libraries including mathematics, physics, chemistry, and geology.

The departments of the college offer graduate degree programs in aeronautical and astronautical, ceramic, civil and environmental, electrical and computer, general, mechanical and industrial, metallurgical, and nuclear engineering, and in computer science, materials science, physics, and theoretical and applied mechanics. Interdisciplinary specialties include bioengineering, engineering design, environmental control, and materials engineering.

The college maintains three major interdisciplinary research laboratories: the Coordinated Science Laboratory (CSL), the Materials Research Laboratory (MRL), and the Microelectronics Laboratory. CSL provides an interdisciplinary research environment for faculty and students from engineering and other disciplines. The research centers on such areas as computer systems, communications, VLSI circuits, artificial intelligence, signal processing, and robotics. MRL, with one of the outstanding facilities for electron microscopy and microanalysis of materials in the United States, supports research and education in the materials sciences in cooperation with a number of engineering and scientific disciplines; multidisciplinary research basic to an understanding of the solid state of matter is stressed. The Microelectronics Laboratory is a multidisciplinary facility for investigating new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors. Within the laboratory, the NSF-sponsored Engineering Research Center on Compound Semiconductor Microelectronics (CCSM) focuses on the use of optical interconnect technologies to eliminate the bottleneck of metal interconnects in high-speed digital systems.

The college has six major federally funded centers: the USEPA-sponsored Center on Environmental Control Technology; the NSF-funded Engineering Research Center on Compound Semiconductor Microelectronics; and four centers funded by the Department of defense under its University Research initiatives program—composite materials, construction technology, cement composite materials, and supercomputing environments.

The campus's two supercomputing centers, while special units of the Graduate College, have a close association with the College of Engineering. The Center for Supercomputing Research and Development is involved with advancing the state of supercomputing in three areas: engineering and architecture, software, and algorithms and applications. The National Center for Supercomputing Applications is one of the premier national centers created by the National Science Foundation in 1984 to provide supercomputers in major U.S. research universities. With a CRAY X/MP 48 with four processors and 8 million words of memory, it is a major basic research facility. The Materials Engineering Research Laboratory is an interdisciplinary laboratory with extensive equipment for the characterization of the mechanical behavior of materials.

FINE AND APPLIED ARTS

The College of Fine and Applied Arts includes: the departments of Dance, Landscape Architecture, Theatre, and Urban and Regional Planning; and the schools of Art and Design, Architecture, and Music. The excellent facilities include Krannert Center for the Performing Arts, Krannert Art Museum, practice rooms, studios, laboratories, exhibition spaces, and specialized libraries.

Krannert Center for the Performing Arts provides studio space for classes in theatre, dance, and music; graduate students participate in many of the public performances in its four theatres as well as in other theatres on campus. Music students use the rehearsal rooms, studios, and auditoriums in Smith Music Hall and in the Music Building. The work of students receiving M.F.A. degrees in the School of Art and Design is exhibited in the Krannert Art Museum, which is connected to the Art and Design Building. Students in the School of Architecture exhibit their work in the Temple Buell Architecture Gallery.

Throughout the year many visiting artists, performers and speakers come to the campus, brought by the college and its departments. Comprehensive libraries in art and architecture, city planning and landscape architecture, and music serve students and faculty.

LAW

The College of Law was established in 1897 and is one of the oldest and most renowned law schools in the nation. The members of the law faculty are graduates of leading law schools and are active in both legal research and public service and work closely with graduate students, both in and out of the classroom.

The College of Law offers three graduate degrees: the Master of Law (LL.M.), the Master of Comparative Law (M.C.L.), and the Doctor of the Science of Law (J.S.D.). The emphasis of the graduate program for graduate lawyers from the U.S. and countries whose legal system is based on the common law is to provide advanced training and research opportunities relevant to a career in teaching. For advanced degree candidates whose basic law training was taken in a civil law jurisdiction, the basic purpose of the program is to provide these candidates with a well rounded background in the methodology and structure of the U.S. legal system. The general organization of the graduate program and the course offerings are particularly suitable for candidates with a professional interest in the field of international business law.

LIBERAL ARTS AND SCIENCES

The College of Liberal Arts and Sciences is the largest college within a university setting in the state of Illinois. The college provides instruction in a diverse set of fields which encompass most of the traditional disciplines in the liberal arts and sciences. The thirty-eight degree-granting departments and programs in the college offer a total of seventy-two undergraduate, fifty-eight master's, and thirty-seven doctoral degree programs. The graduate instructional programs of the individual departments and units of the college are discussed in the Programs of Study section of this catalog.

The units providing graduate instruction and graduate degrees in the college are listed below:

School of Chemical Sciences
Department of Biochemistry
Department of Chemical Engineering
Department of Chemistry

School of Life Sciences
Department of Anatomical Sciences[1]
Department of Ecology, Ethology, and Evolution
Department of Entomology
Department of Genetics and Development[2]
Department of Microbiology
Department of Physiology and Biophysics
Department of Plant Biology

Other Department and Units
Center for African Studies
Department of Anthropology
Department of Astronomy
Center for East Asian and Pacific Studies
Department of the Classics
Program in Comparative Literature
Department of English
Division of English as an International Language
Department of French
Department of Geography
Department of Geology
Department of Germanic Languages and Literatures
Department of History
Center for Latin American and Caribbean Studies
Department of Linguistics
Department of Mathematics
Department of Philosophy
Department of Political Science
Department of Psychology
Program for the Study of Religion
Center for Russian and East European Studies
Department of Slavic Languages and Literatures
Department of Sociology
Department of Spanish, Italian, and Portuguese
Department of Speech and Hearing Science
Department of Speech Communication
Department of Statistics

Most of these units have prepared brochures and materials describing, in greater detail than is possible here, the resources and facilities available for graduate students, research efforts, and graduate instruction. The reader should contact the unit in which he or she is interested to obtain further information. The following is a brief description of the major kinds of resources and facilities available to students in units of the college. The specific resources described are only examples of those available in each category.

School and Departmental Libraries

A number of units in the college have exceptional departmental libraries conveniently located near the units. In particular, as mentioned on page 7, the libraries in chemistry, life sciences, and mathematics are excellent. A number of the collections for the humanities and social sciences are outstanding, for example, the Slavic collection, the Asian Library, and the map and geography library. (See pages 7 and 8.)

[1]At the time of printing, a proposal to change the name to Department of Cell and Structural Biology was pending.

[2]At the date of printing a proposal to dissolve the Department of Genetics and Development was pending.

Museums and Collections

There are two particular resources administered by departments in the Life Sciences: the Herbarium and the Museum of Natural History. The Herbarium is the tenth largest herbarium situated at an American university. It is both a research and teaching facility and its staff serves the public by assisting in the identification of plants.

The Museum of Natural History has served faculty members and graduate students engaged in research since the 1870s. A number of special collections, including reptiles, amphibians, mammals, and shells from all parts of the world, are housed in the museum. Research specimens for advanced scientific study number over 400,000.

Two collections of special note in the humanities are the American Center of the International Photographic Archive of Papyri and the Cinema Studies Film Archive.

The World Heritage Museum houses more than 25,000 artifacts that illustrate cultural achievements from prehistoric Europe; ancient Mesopotamia, Egypt, Greece, and Rome; Northern Europe; Africa; the Orient; and America. The museum's collections are heavily used by University classes in history, art history, classics, and anthropology for general tours and individual research projects.

Clinical and Training Facilities

The Department of Psychology operates the Psychological Clinic which is the principal facility for training and research in clinical psychology. The Department of Speech and Hearing Science operates three clinics to provide training for its students (speech, language, and hearing clinics). The Department of Astronomy operates, in conjunction with San Diego State University, a one-meter optical telescope at Mt. Laguna in California for training and research purposes; in addition, the department arranges for observation time for students on both optical and radio telescopes at other sites.

Laboratories

All of the units in the life sciences, the physical sciences, psychology, and speech and hearing science have extensive laboratory facilities. Of particular note are the facilities of the School of Chemical Sciences and the Center for Electron Microscopy. In addition, there are two outstanding laboratories in the humanities and social sciences: the Language Learning Laboratory in the School of Humanities and the Spatial Data Analysis Laboratory in the Department of Geography.

The technical facilities of the School of Chemical Sciences include molecular spectroscopy, mass spectroscopy, and laser spectroscopy laboratories; a radioisotope laboratory; a computer center; a microanalytical laboratory; hydrogenation and high-pressure facilities; and machine, electronic, electrical, and glass-blowing shops.

The Center for Electron Microscopy is a campus facility designed to meet the instructional and research needs of faculty and graduate students from all scientific areas on campus and is involved with developing new instructional and research techniques in electron microscopy. The center's instructional program is among the largest and most varied in the nation, providing a number of specialty courses. In addition to electron microscopes, the center has a laboratory equipped for state-of-the-art freeze fracturing and cryoul-

tramicrotomy, a computerized digitizing system for the morphometric analyses of electron micrographs, and a number of ancillary equipment items for microtomy, vacuum evaporation, freeze and critical point drying, and light microscopy. The major equipment includes three transmission electron microscopes, three scanning electron microscopes and an automated microprobe operated in conjunction with the Department of Geology, which provides both the highest resolution scanning and transmission electron microscopes currently available for research use.

The Language Learning Laboratory (LLL), in addition to providing teaching facilities, promotes research in language learning and teaching. Advanced technological resources, including PLATO, CYBER, microcomputers, and television production facilities, are available for the LLL.

The Spatial Data Analysis Laboratory, which is administered by the Department of Geography, is responsible for developing and improving research and instruction related to the acquisition, analysis, and display of spatial data. Technical service facilities (including electronic coordinate digitizers, computer terminals, graphics terminals, darkroom photo-processing facilities, and a remote sensing and air photo laboratory) are available.

Quantitative Services

There are special computing resources available in many departments in the college; at the same time, all units on campus have access to the Computing Services Office (see page 11). For example, the Department of Astronomy has direct access to the VAX 11/780 computer, shared with three other units on campus.

The National Center for Supercomputing Applications has a CRAY X/MP 24, the fastest commercially available supercomputer, in operation. The center provides access to the CRAY to researchers from a wide range of fields. Several of the scientists in the center also work with students. Further description of the center may be found on page .

The Department of Statistics, through the Mathematical and Statistical Consulting Committee, provides a consulting service to faculty and graduate students from all areas of the University. The service provides assistance in design and analysis of various statistical projects.

Interdisciplinary Research Efforts

Units in the college participate in a number of campuswide interdisciplinary efforts, many of which are described elsewhere in this catalog. Some of the instructional units in the college are by nature interdisciplinary. The area studies centers (African Studies, East Asian and Pacific Studies, Latin American and Caribbean Studies, and Russian and East European Studies) are examples of these; their degree programs are described in the Programs of Study section. There are two special units within the School of Humanities which are of note: the Unit for Cinema Studies and the Unit for Criticism and Interpretive Theory.

The Unit for Cinema Studies promotes and coordinates the critical and historical study of the cinema. Its membership represents several departments and reflects a variety of critical and scholarly interests. The unit is also a resource center which promotes cinema teaching and scholarship through its growing archive of film materials and its editorial and analytical equipment for film study.

The Unit for Criticism and Interpretive Theory, an interdisciplinary program drawing upon fifteen humanities and social science departments, promotes a broad range of teaching, research, and related scholarly activities. For A.M. and Ph.D. degree students in participating departments, the unit offers a formal program leading to advanced certification in criticism and interpretive theory.

There are a number of other groups (some informal) of faculty and students working together on interdisciplinary studies. Examples of these are the Afro-American Academic and Research Program; the Program in Arms Control, Disarmament and International Security; the Science, Technology and Society Program; the Southwest Asia Studies Program; and the Office of Women's Studies.

Scholarly Journals

A number of major scholarly journals are edited in units within the college; among these are *Comparative Literature Studies*, *Illinois Classical Studies*, *Journal of English and Germanic Philology*, and *Illinois Journal of Mathematics*.

Placement Services

All departments and schools assist their students in seeking placement. In some cases, resources in schools or departments are pooled; the Schools of Chemical Sciences and Life Sciences, and the Department of Mathematics have each organized central placement services. Other units have their own placement programs or assist students individually. Also, the School of Humanities has a graduate intern in the campus Career Development and Placement Office to assist students.

VETERINARY MEDICINE

The graduate programs in the College of Veterinary Medicine emphasize research training involving animal health, pharmacology, infectious and metabolic diseases, toxicology, zoonotic diseases, reproductive physiology, public health, biotechnology, and comparative medicine. The college has new, modern clinical and basic sciences facilities for graduate study and research ranging from basic biotechnology to applied clinical and field studies under controlled confinement and natural environmental conditions. Major emphasis is being placed on graduate training in biotechnology. Interdisciplinary research is ongoing with other colleges on the Urbana-Champaign campus and at the Dixon Springs Agricultural Center in southern Illinois. The college's association with the Illinois State Department of Agriculture, Department of Public Health, and Department of Conservation provides opportunities to utilize field facilities for appropriate research projects.

Resources, Facilities, and Services

CULTURAL RESOURCES

The University of Illinois at Urbana-Champaign is a major cultural center. Krannert Center for the Performing Arts, designed by alumnus Max Abramovitz, architect of New York City's Lincoln Center, has four theatres and is a magnificent showcase for music, theatre, opera and dance. It also has an open air amphitheater and five major rehearsal rooms that are used by students in professional training programs in the performing arts. More than 350 public performances are presented there each year. Internationally known performers are brought to the campus to augment the offerings of the Departments of Theatre and Dance and the School of Music.

Krannert Art Museum has a full schedule of exhibitions, from its own collection as well as traveling exhibitions. The Festival Gallery in the Krannert Center for the Performing Arts brings to the campus a series of one-man shows of contemporary artists. The World Heritage Museum, housing collections of artifacts from cities and civilizations from all parts of the world, the Museum of Natural History, which has displays on early man, flowering and nonflowering fossil plants, animal exhibits, and over 400,000 research specimens, and the John Philip Sousa Museum and Library are used for research, teaching, and enjoyment. Student work in architecture and related areas is exhibited in the Temple Buell gallery.

The Japan House provides members of the campus community an opportunity to experience the teaching of Japanese arts in a realistic environment.

Distinguished public figures and outstanding scholars appear regularly on campus for symposia, lectures, forums, and public discussions.

WILL-TV and WILL AM and FM radio stations, all affiliated with the Public Broadcasting Service, provide a wide range of cultural programs to a large area of the state.

The Illini Union, the campus social center, contains cafeteria and dining facilities, guest rooms, art galleries, reading and television rooms, billiards and electronic game rooms, bowling lanes, a ticket and check cashing counter, alumni offices, and a paperback book sales center. Special events are scheduled throughout the year. The Illini Union Gallery provides exhibits of a broad range of contemporary art and craft objects.

Many concerts are given in the Music Building and Smith Music Hall and many films are shown on campus throughout the year. Students direct, produce, and act in plays presented at the Armory Free Theatre.

RECREATIONAL FACILITIES

The University of Illinois is the home of one of the top collegiate recreational sports programs in the nation, the Division of Campus Recreation (DCR). All

sectors of the University can and do participate in the multifaceted recreation programs sponsored by the division.

Recreational programs and services include excellent multipurpose facilities, special events, outdoor recreation, sports clubs, intramurals, exercise and fitness programs, Ice Arena activities, and student leadership and employment opportunities.

One of the most popular recreational areas on campus is the Intramural-Physical Education (IMPE) Building on Peabody Drive. This facility contains gymnasiums, indoor and outdoor swimming pools, handball/racquetball and squash courts, and outdoor tennis courts. There are also weight training and exercise rooms, an archery range, a camping equipment and resource room, a golf driving and putting room, a games room, combatives rooms, and offices.

The newly renovated and remodeled Ice Arena, 406 East Armory, is open from October to April for various activities, including skating, hockey, broomball, skating lessons, and parties. The Ice Arena is also available during the non-ice season for indoor soccer, dances, floor hockey, roller skating, and parties.

Throughout the year, DCR offers diverse programs to appeal to a wide range of interests. These special events include Quad Day, the All-Nighter, Sports Trivia Bowl, Almost Anything Goes, poolside concerts, and activities for children living in Orchard Downs.

Exercise and fitness programs sponsored by DCR include aerobics classes, water exercise, dance fitness, low impact aerobics, and the Illini Century Club for self-paced wheel chair pushers, joggers, swimmers, and cyclists. Several wellness clinics are also offered through the year.

More than forty different sports clubs provide a variety of activities for students, ranging from martial arts and scuba to rugby and ice hockey. Team and individual sports competition, practice sessions, and tournaments with other universities are possible.

The outdoor recreation program offers opportunities for students to rent camping and sports equipment, including tents, backpacks, and skiis. Several outdoor clinics, weekend workshops, and extended trips to such areas as the Grand Canyon and the Florida Everglades are scheduled during the year.

Approximately forty activities are available to students in the organized intramural sports program. Students can participate in men's, women's, co-recreational, and grad/faculty/staff divisions in sports ranging from flag football, soccer, and basketball to tennis, swimming, and wrestling. Novel sports such as inner tube water polo, ultimate frisbee, broomball, and wallyball have many enthusiastic participants.

Students may apply for part-time employment and volunteer leadership opportunities. More than 400 students work as intramural sports officials and supervisors, lifeguards, receptionists, designers, aerobic instructors, first aid supervisors, building supervisors, and intramural managers each year.

INTERNATIONAL PROGRAMS AND STUDIES

The University of Illinois at Urbana-Champaign offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate study and research often form an integral part of University programs with foreign institutions. Research opportunities are available through many departments: the Graduate College, the Center for African Studies, the Center for East Asian and Pacific Studies, the Center for Latin American and

Caribbean Studies, the Center for Russian and East Europeans Studies, and the Program in South and West Asian Studies.

For full information on these opportunities, as well as other graduate study-abroad programs and a wide range of courses and seminars in international studies, write for the handbook *International Programs and Activities*, obtainable from International Programs and Studies, 324 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820, or contact the appropriate college or department.

In addition, overseas teaching opportunities are often available in music education, English as an international language, and some of the modern language departments. Interested students should consult the executive officer of the appropriate department or division.

CIC TRAVELING SCHOLAR PROGRAM

The Committee on Institutional Cooperation, a consortium of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to attend other CIC institutions in order to take advantage of special course offerings, laboratory facilities, or library collections. Visits of traveling scholars are limited to two semesters or three quarters. Traveling scholars register and pay regular fees at their home universities. Credit earned while in this program is automatically accepted by the home university.

Application forms are available from the Records Office, Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

REHABILITATION-EDUCATION SERVICES

For information about graduate education and degree programs in rehabilitation education with areas of specialization in counseling and administration, students are encouraged to contact the Office of the Director. Since 1947 the University of Illinois at Urbana-Champaign has pioneered in facilitating the education of physically disabled students. Campus facilities are among the best in the nation, and applications from persons with physical disabilities are welcomed. The Division of Rehabilitation-Education Services, in the College of Applied Life Studies, which is responsible for planning campus facilities to ensure that all are accessible to and usable by the physically disabled, provides a variety of services and opportunities to physically disabled students. These include early registration privileges, housing arrangements, transportation, prosthetic repair, physical therapy and functional training, occupational therapy, medical services, counseling services, recreation and athletics, and services to the visually and hearing impaired. Applicants are encouraged to make direct contact with the division at the Rehabilitation-Education Center, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, Illinois 61820, (217) 333-4600, for further information.

Since some graduate programs require a variety of physical skills, prospective students with permanent physical disabilities are strongly encouraged to communicate with the division to ascertain how their particular program can be implemented. The division works closely with academic units to establish the manner in which degree requirements can be met.

HOUSING

The University of Illinois maintains housing for single graduate students in two residence halls within walking distance of the campus. Each study room is furnished and connects with a complete bath shared with the residents of one or two other rooms. Single and double rooms are available. Cooking is not allowed in student rooms, but a contract for food service in nearby dining rooms can be arranged. Residence halls have lounge facilities, laundry rooms, and vending machines.

Students must be admitted before they can sign a contract. Priority in assignment is determined by the date the completed contract is received. For information, write to the Residence Hall Contracts Office, 200 Clark Hall, 1203 South Fourth Street, Champaign, Illinois 61820.

Married students and students with families can choose from one-bedroom (furnished) or two-bedroom (furnished or unfurnished) apartments. All units include a stove and a refrigerator. Convenient laundry facilities are available. For information, write to the Family Housing Office, 1841 Orchard Place, Urbana, Illinois 61801.

The Housing Information Office also maintains a current listing of privately owned apartments and rooms available in the community. Students seeking private housing are urged to visit the campus as early as possible since all arrangements for this type of accommodation should be made in person. In some instances, it may be necessary to make arrangements as much as six months before the opening of the school term. Anyone unfamiliar with standard leasing practices should ask a housing consultant for assistance. The Housing Information Office, University of Illinois at Urbana-Champaign, is located at 2 Fred H. Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820, (217) 333-1420.

The University of Illinois at Urbana-Champaign and the University residence halls are committed to a policy of nondiscrimination with respect to race, color, national origin, ancestry, religion, sex, marital status, age, handicap, unfavorable discharge from the military, or status as a disabled veteran or veteran of the Vietnam era.

HEALTH SERVICE AND INSURANCE

Students enrolled in credit courses and in attendance on the Urbana-Champaign campus are assessed separate fees which cover (1) health service at the McKinley Health Center and (2) group health insurance.

Health Service

The health service fee supports the medical services available at the McKinley Health Center on campus. Dependents are not eligible for care at the health center unless they are also enrolled students at the Urbana-Champaign campus. McKinley Health Center offers these services: (1) routine office care, (2) referral for hospitalization, (3) care for injuries or acute illnesses, (4) mental health care, (5) health education, and (6) preventive health services. All of these services are available at no additional cost to students who have paid the health service fee.

Health center physicians and nurses provide general medical care and advice while students are on campus, and students may consult the health center physician of their choice by appointment. The physician can utilize a

wide range of diagnostic tests, including laboratory procedures and radiologic examinations. A pharmacy provides most medications at no cost to students when they are under the care of a health center physician. The McKinley Health Center is fully accredited as an ambulatory health care facility by the Joint Commission on Accreditation of Hospitals.

Group Health Insurance

The University insurance plan provides worldwide hospital-medical-surgical coverage (up to $100,000) for the insured student and the choice of any legally qualified hospital or licensed physician. It also includes a $3,000 accidental death and dismemberment benefit. The coverage is provided on a term basis and includes all holidays in the term, as well as the period between terms. Brochures that describe the University insurance plan in detail are available at registration and at the Student Insurance Office.

An insured student who wishes to extend health insurance coverage to his or her spouse and children may do so. Students enrolled for the spring semester who do not plan to attend the summer session may elect to extend their insurance for the entire summer vacation period by applying and paying the insurance premium to the Student Insurance Office.

Insured students may extend coverage for themselves and their dependents following graduation or withdrawal from school. This must be done before they leave campus; it cannot be done by mail. The Student Insurance Office will provide information on procedures.

Students who present evidence of continuing equivalent medical insurance coverage may be exempted from paying the fee for the University insurance if they submit a petition to the Student Insurance Office during the period provided for the exemption of fees and it is approved. Once the student is declared exempt, the exemption is continuous.

Students may request they be reinstated at any time during a term; however, reentry into the insurance program is subject to approval of a medical history. If approved, coverage is effective on the date of the application. There is no prorated premium.

Requirements and Procedures

ADMISSION AND REGISTRATION

General Requirements

The Graduate College considers for admission only those applicants graduated from an accredited college or university who hold or will be granted by the end of the current academic year a baccalaureate degree (or its equivalent) comparable in content and in number of credit hours with that granted by the University of Illinois at Urbana-Champaign. Also applicants must have an admission average of at least 4.0 (A = 5.0) computed from the last 60 hours of undergraduate work and any graduate work completed. Meeting these minimum admission requirements of the Graduate College, however, does not guarantee admission; individual departments may set a minimum grade-point average higher than that of the Graduate College and may impose other special admission requirements and conditions. Because applicants to most departments compete for a limited number of positions, many who exceed minimum requirements may be denied admission.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses which have a bearing on the student's field of specialization should submit a written evaluation or a letter grade by the instructor in each such course along with scores on the Graduate Record Examination. Because some departments have special examination requirements, applicants should check with their departments; for example, accountancy and business administration use the Graduate Management Admission Test instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in November or December for the summer session and fall semester, and September or October for the spring semester. Applications will not be accepted during the three weeks preceding the beginning of a term.

Application forms may be obtained from the major department or the Graduate College, University of Illinois at Urbana-Champaign, 107 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820. A nonrefundable application fee must accompany the application.

International applicants must submit official records of all higher education, including certificates of degrees with the dates the degrees were conferred. If only one original is available and would be difficult to replace, an attested or certified copy should be submitted. All records not in English must be accompanied by a translated record. Records should show the individual subjects studied and the grades received in each subject.

International Applicants are required to submit proof of adequate finances for the entire period of planned study. Applicants unable to provide satisfactory evidence of adequate finances will not be granted admission.

Eligible applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) given several times a year throughout the world. Applicants should make arrangements directly with the Educational Testing Service, Box 899, Princeton, New Jersey 08541, U.S.A. Graduate applicants, however, are exempt from this testing if they have completed at least two academic years of full-time study within five years of the proposed date of enrollment in the University in a country where English is the primary language and in a school where English is the primary language of instruction.

The University requires a score of at least 520 on the TOEFL examination and some departments require higher scores. All non-native, English-speaking applicants to the Graduate College who are offered admission on the basis of their academic credentials but score below 590 on the TOEFL or fail to submit a required TOEFL score, will be admitted on limited status and required to take the English Placement Test (EPT) upon their arrival.

The Notice of Admission

Each applicant recommended for admission by a graduate department and who is determined to be eligible by the Office of Admissions and Records or the Graduate College will be issued a Notice of Admission for the term that he or she desires to enter. The Notice of Admission is official verification that admission has been approved for a specific term and should be brought to the initial registration.

An applicant who, either before or after admission is approved, wishes to change the designated term of entry usually must submit another application (and include an additional processing fee) unless his or her major department is willing to request that this requirement be waived. Such requests will be considered by the Office of Admissions and Records provided that the newly desired term is within one year of the term of entry originally requested. Applicants should note that a Notice of Admission issued for the summer term, if not marked "Summers Only," is valid for the following fall semester, and that a Notice of Admission for the fall term is also valid for the preceding summer session.

The Notice of Admission will specify the admission status of the student: whether the admission is as a degree candidate or as a nondegree student, whether full graduate standing or limited status has been approved, and whether additional credentials are still needed. Each admitted student must submit complete academic credentials to the Office of Admissions and Records before the registration period for the student's second term of attendance. Registration for the second term will be encumbered if the required official transcripts have not been received.

The Notice of Admission may state specific conditions for admission. Admitted students should have a clear understanding of the conditions or should seek clarification from their major departments. A student may be admitted on limited status if his or her preadmission grade-point average (GPA), which is based on the last 60 semester hours of undergraduate work, is below the Graduate College minimum of 4.0 (A = 5.0), or if the academic record shows other deficiencies or nontraditional academic qualifications. After the student has satisfied the conditions imposed, his or her major department should request the Graduate College to change the student from limited status to full graduate standing. No advanced degree will be awarded to a student who has not qualified for, and been granted, full graduate standing.

Enrollment Patterns

Each student admitted can choose one of two enrollment patterns: (1) Continuous—the student must enroll each fall and spring semester, with summer sessions optional; or (2) Consecutive Summers Only—the student enrolls only for summer sessions. Once an option has been chosen and is established by enrollment, the pattern may not be broken unless the Graduate College approves a leave of absence or the Office of Admissions and Records gives permission to change the enrollment pattern. Graduate students who break their patterns of enrollment without prior approval must apply for readmission in order to resume their studies. However, an applicant for readmission to a graduate degree program in which he or she was enrolled within the previous five years is not required to pay the application fee.

Nondegree Status

Students with nondegree status are admitted to courses on a part-time basis if there is enough space. Once accepted for admission by a department and the Graduate College, a nondegree student has the same enrollment pattern options as a degree candidate. Either the major department or the Graduate College, however, may discontinue the nondegree status at the end of any term. A nondegree student need not apply for admission as long as he or she maintains one of the established patterns of enrollment.

There are several restrictions and conditions which apply to nondegree status. Nondegree students:

a. Are not eligible to advance enroll.
b. Cannot register until after the third day of classes of the fall or spring semester. The late registration fee will be waived if the student completes his or her registration on or before the tenth day of instruction in a semester.
c. Are required to have approval each term from both their home department and the department offering the course in which they wish to enroll. Admission does not guarantee, therefore, that the student will be able to enroll in all courses desired.
d. Are limited to taking fewer than 3 units per semester. A nondegree student will not be granted full-time status unless he or she is participating in a special program for which full-time approval has been obtained from the Graduate College prior to admission.
e. Are not eligible for financial aid administered by the Graduate College.
f. Must apply for readmission if they wish to become candidates for a degree. If the student is later approved for degree status, a minimum of 3 units of nondegree credit may be applied to a degree.

A nondegree student who wishes to enroll only during the summer sessions need not be admitted by a specific department but may carry an unassigned student status with the Graduate College. Certification of an earned degree is all that is required for admission. Such a student is allowed to register continuously from summer to summer until his or her pattern of enrollment is broken.

Registration

Currently enrolled degree students should advance enroll for the following semester and complete their registration by mail. New and other students

who have not advance enrolled should meet with their advisers and complete their schedules before going through on-campus registration which occurs during the week preceding the start of instruction in a semester. Students who advance enroll are more likely to gain entry into the classes they desire. There is no advance enrollment for the eight-week summer session.

Because course descriptions found in the *Courses Catalog* are sometimes incomplete or outdated, students should check with their department's graduate studies office or talk with instructors involved to find out about reading lists, papers, projects, and examinations for particular classes.

On-campus registration occurs during a period immediately preceding the start of instruction in a semester. At this time, students who are not advance enrolled or encumbered and advance-enrolled students who need to make class schedule changes complete their registration. Students who have not enrolled in advance or who need to make class schedule changes must meet with their advisers and make up their schedules before going through registration. Instructions on how to get through the registration process are printed each semester and are available in all departmental offices.

There is a $15 fee for late registration. (It is possible to be assessed a late fee up to $50 depending on nonpayment of fees by deadlines.) If, however, failure to complete registration during the regular period is in some way the fault of the University or there are extenuating circumstances such as severe illness or hospitalization, a student may petition the Records Office of the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, Illinois 61801, for a waiver of the fee.

TUBERCULOSIS CONTROL

All new, transfer, and readmitted students are encouraged to present evidence of freedom from tuberculosis at the University's McKinley Health Center. Proof of freedom from tuberculosis is necessary for some students, such as new teaching assistants and those who have jobs handling food. All new international students are required to complete tuberculosis screening at McKinley Health Center before finishing registration. Final evidence of freedom from tuberculosis is established by presenting a University of Illinois or public health agency certificate dated within the previous twelve months or by undergoing a tuberculin skin test at the McKinley Health Center that is read negatively at the Health Center within forty-eight to seventy-two hours later.

TUITION AND FEES

Since tuition and fees are subject to change, it is difficult to provide exact information. Tuition and fees are assessed on the basis of a student's status (resident or nonresident of Illinois), college of enrollment, and the number of credit hours taken each term. In computing fees, 1 unit is equivalent to 4 semester hours. A complete schedule of fees and an explanation of the eligibility requirements for full or partial exemption are available from the Tuition and Fee Assessment Section, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, Illinois 61801.

Residency for Tuition Assessment

Tuition is assessed on the basis of whether a student is a resident or nonresident

of the state of Illinois in accordance with the *University of Illinois Regulations Governing the Determination of Residency for Admissions and Assessment of Student Tuition.* These regulations are published in the *Code on Campus Affairs and Regulations Applying to All Students,* which is offered to all students during on-campus registration and is available at the Post-Registration Service Center in the Illini Union; in 177 Administration Building; and at the Student Assistance Center, 107 Fred H. Turner Student Services Building. The residency regulations and petitions for changing a student's status are available on request from the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 178 Administration Building, 506 South Wright Street, Urbana, Illinois 61801.

Generally, in order to be considered a resident for assessment of tuition, a person must have been a bona fide resident of the state of Illinois for at least six consecutive months immediately preceding the beginning of any term for which he or she registers and must continue to maintain a bona fide residency in Illinois. If an adult student has at least one parent who is a bona fide resident of Illinois, this six-months continuous residency rule is waived so long as the student resides in Illinois during the period of registration at the University.

Staff members of the University and allied agencies, including teaching and research assistants on appointment for at least 25 percent of full-time services for not less than three-fourths of the term as well as their spouses and dependent children, are treated as residents for tuition assessment purposes as long as they hold their appointments. Professional staff and teachers in private or public elementary and secondary schools in Illinois are also eligible for in-state tuition charges. Persons serving on active duty in one of the armed forces of the United States who are stationed and present in the state of Illinois, their spouses, and dependent children may qualify upon petition for the in-state tuition rate. A student who is a U.S. citizen may also qualify upon petition for resident status if he or she is married to a resident of Illinois who meets all the requirements of the residency regulations. A person who is not a U.S. citizen who meets and complies with all other applicable requirements may establish residence status (by petition) unless the person holds a visa which on its face precludes an intent to reside in the United States.

Installment Plan for Payment of Charges

Students enrolled on campus may elect to pay tuition, service fees, insurance, health service, computer fee, general fee, flight instruction, and University residence hall charges (single-student housing only) in three approximately equal installments. The first installment is payable by the due date shown on the Post-Registration Statement (within the first ten days of classes), the second is payable in October (March for spring semester), and the third in November (April for spring semester).

Students electing the installment plan are assessed a finance charge of one percent of the amount deferred or a minimum of $2.00, whichever is greater. Deferred installments and other charges billed through the student accounts receivable system are subject to a delinquent service charge of one percent per month ($1.00 minimum) on any amounts not paid when due.

Refunds

Students who have not attended any classes nor received any student services

may cancel their registration agreement by 5 p.m. on the first day of class in a term if they obtain the approval of the Dean of the Graduate College. Students will not be charged tuition and fees if their registration is cancelled.

If students withdraw from the University during the first ten days of instruction in a semester or during the first seven days in the eight-week summer session, tuition and a portion of fees will be refunded. The University will refund tuition but retain one-half of the service fee, the general fee and the computer fee, and all of the McKinley Health Service fee and the health insurance fee. Health services and insurance coverage for students continue until the end of the term. The last day for this partial refund is noted in the *Graduate College Calendar* and in the calendar printed in each semester's *Timetable.* In cases of serious illness or injury, exceptions to these refund periods may be made by the director of admissions and records. Special refunds are provided for students who withdraw for military service after this ten- or seven-day period. If it is necessary to withdraw from the University and there is a question concerning a refund, a student should first inquire in the Graduate College Student Records Office, University of Illinois at Urbana-Champaign, B-3 North Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

FINANCIAL AID AND EMPLOYMENT

Financial aid is available in the form of fellowships, tuition and service fee waivers, college work-study programs, and loans. Employment is available in the form of teaching and research assistantships.

Application Procedures

When students submit a single Application for Graduate Appointment to their major department, they will be considered for fellowships (except those awarded in national competitions), tuition and service fee waivers, and departmental assistantships. Prospective students should complete the Combined Application for Admission to the Graduate College and Application for Graduate Appointment to be considered for these appointments. The Graduate College administers most of the fellowship and waiver awards. Financial need is not a factor in awarding fellowships, waivers, or assistantships administered by the University. Application for Graduate Appointment forms for continuing students can be obtained from the Graduate College or from any graduate department.

Continuing or new students should file applications with their major department no later than February 15 and preferably earlier. (Some departments have deadlines earlier than February 15.) While departments may, at their discretion, accept applications for assistantships and waivers after the February 15 deadline, most departments attempt to make their financial aid decisions in February and March. Departmental committees recommend students for fellowships or waivers to the Graduate College, which makes the final selections. Each department appoints its own teaching or research assistants with the approval of the Office of the Vice-Chancellor for Academic Affairs. Fellowships can be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates. The first list of fellowship awards is usually announced in mid-March.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible to

compete for University Fellowships that are awarded on the basis of academic and scholarly achievement. A student need not be a U.S. citizen to apply. Departments (with Graduate College approval) may combine University Fellowship stipends with teaching or research assistantship appointments. Students should consult their departments about available support.

Graduate College Fellowships. These fellowships are part of the Graduate College's effort to increase the enrollment of minority students in those academic areas where they have traditionally been underrepresented. Graduate College fellowships are generally awarded to students who are beginning graduate work so that they can devote their first year entirely to study.

Most Graduate College fellows are given support in the form of other fellowships and assistantships to continue their studies in subsequent years provided their progress is satisfactory; however, continued support cannot be guaranteed in advance. Graduate College permission is required for concurrent employment of any type.

Industrial, Endowed, and Special Fellowships and Traineeships. A number of firms, foundations, and individuals support fellowship awards for graduate students. The stipends and supplemental allowances for these fellowships vary, and most of them are restricted to students in particular areas of study. In almost all cases, these awards provide tuition and most fees. Students should consult their departments about the availability of these fellowships.

Federal Fellowships. These fellowships, such as the U.S. Public Health Service Traineeships in the biomedical sciences and the Patricia Roberts Harris Fellowships in fields where minorities are underrepresented, are awarded as grants to institutions which then select the recipients. Students should consult their departments as to the availability of these awards. Applicants for most federal fellowships must be United States citizens or permanent resident aliens; some programs are restricted to United States citizens.

Fellowships Awarded in National Competition. The National Science Foundation awards approximately 550 fellowships nationwide each year to exceptional students in science and engineering, the social sciences, and the history and philosophy of science. They are restricted to students who have completed not more than one semester of graduate study and will be continued for up to three years contingent upon satisfactory progress. Applications are available in October from the Graduate College Fellowship Office, University of Illinois at Urbana-Champaign.

The Mellon Fellowships in the Humanities are awarded to top-level, beginning graduate students who plan careers of teaching and scholarship in the humanistic disciplines. A Mellon Fellowship provides a stipend for a maximum of three years as well as complete remission of tuition and fees and is tenable at any accredited graduate program in the United States and Canada. Prospective applicants must be nominated by a faculty member. The nomination deadline is November 4 of each year. For information, write Mellon Fellowships in the Humanities, P.O. Box 288 (16 John Street), Princeton, NJ 08540.

The Office of Naval Research awards three-year fellowships to outstanding students in certain fields in the sciences and engineering. U.S. citizens studying at Ph.D.-granting institutions are eligible. Applications are available in the Graduate College Fellowship Office each January.

Subject to the availability of funds, the Jacob Javits Fellowship Program, administered by the U.S. Department of Education, awards about 100 fellowships each year in a nationwide competition. The fellowships provide all tuition

and fees as well as a stipend calculated on the student's financial need. U.S. citizens and permanent residents are eligible to apply. Applications are available in the late fall.

A few other foundations and agencies also hold fellowship competitions but on a smaller scale and usually restricted to specific groups, such as the Committee on Institutional Cooperation fellowships for minority students or the American Association of University Women fellowships. Information on these and other fellowships is available early each fall in the Graduate College Fellowship Office.

Assistantships

General Information. The various departments of the University appoint graduate students as teaching or research assistants. Application should be made directly to the appropriate department using the Application for Graduate Appointment. Persons holding assistantships must be registered during the semesters of employment and, in the case of assistantships requiring the performance of classroom teaching, be proficient in oral English as determined by current University verification standards. Assistantship appointments ranging from 25 through 67 percent time for three-quarters of the semester provide waivers of tuition and part of the fees. Students who held such waivers during the spring semester, and who have no appointment the following summer, are also entitled to a waiver of tuition and part of the fees for that summer session. As an additional benefit, spouses and dependent children of staff members who have appointments of at least 25 percent are treated as residents for purposes of tuition assessment. Students may also apply for assistantships in one of the nonteaching units of the University, such as the Survey Research Laboratory.

Part-time appointments as student residence hall advisers also are available. These jobs provide room and board only. The student affairs coordinator for staff development in the Housing Division has applications for residence hall adviser appointments.

Students who resign their appointments before working for at least three-fourths of the term (ninety-one days during the regular semester—forty-one days during the summer session) will be assessed tuition and fees unless they either withdraw from the University at the same time or before an appointment becomes void or file a clearance form for graduation within one week following the resignation date. A term is defined as running from the first day of registration through the last day of final examinations.

College Work-Study Assistantships

The Graduate College operates a small program of research and administrative assistantships funded by the College Work Study program. Prospective applicants must have ensured employment at the time of application, which should take place before January 31 of each year. To apply, the applicant should fill out a screening questionnaire in the Fellowship Office, 209 Coble Hall. If eligible, he or she may use the need-based financial aid procedures described on page 41.

Tuition and Service Fee Waivers

In addition to the tuition and service fee waivers which accompany fellowships

and assistantships, the Graduate College awards a number of waivers each year. These waivers provide exemption from tuition and some fees for the academic year and the summer session immediately preceding or following that year. To hold a waiver, a student must register for at least 3 units each semester during the academic year and 1½ units in the summer session. While holding a waiver, he or she may accept part-time or incidental employment not to exceed twenty hours per week either with the University or with an outside employer.

Research Grants

Graduate College Dissertation Research Grants. If funds are available, the Graduate College offers dissertation research grants to students with superior academic records. For further information, inquire in the Graduate College Fellowship Office.

Other Research Grants. A great number of organizations and foundations offer grants to support research in specialized fields. Information on these grants can be obtained from the Graduate College Fellowship Office, the Research Services Office, and from departmental offices. Some schools and colleges publish additional materials concerning research grants and contracts. The Research Services Office compiles information on research grants and publishes the *Graduate Student Handbook on Financial Assistance;* staff members will assist researchers in their search for funding.

Need-Based Financial Aid

The Office of Student Financial Aid awards limited scholarships, college work-study, and loans to graduate and professional students. Application for this need-based assistance is made separately from an application for fellowships, assistantships, and tuition and service fee waivers. A need analysis document, either the Family Financial Statement (FFS) or the Financial Aid Form (FAF), must be completed. To ensure priority consideration, the document should be filed between January 1 and March 15 of each year.

Students wishing to borrow a Guaranteed Student Loan must file the FFS or FAF in addition to the loan application. Students are advised to delay processing a guaranteed loan application until they have received responses to applications for other need-based assistance and fellowships, assistantships, and tuition and service fee waivers.

Additional information about need-based assistance and application packets containing the Family Financial Statement are available from the Office of Student Financial Aid.

If certification for full-time status is required (for example, for loans, immigration, or fellowships), registration must be for at least 3 units or the equivalent.

Veterans' Assistance

Veterans who believe they may be eligible for educational benefits should contact the veterans' counselor in the Office of Student Financial Aid. Application for benefits should be made annually.

Employment

Part-time job opportunities, both on and off campus, are posted in the Office

of Student Financial Aid. Students do not need to apply for need-based assistance to use employment staff services.

Emergency Loans

In addition to major educational loans, the University makes special funds available. Graduate students with financial problems should go to the Office of the Dean of Students. Staff members in that office can determine the eligibility of these students for an emergency loan.

Students may also apply for guaranteed loans through lenders in their home towns who participate in one of the various guaranteed loan programs.

In addition to major educational loans, the University makes special funds available. Graduate students with cash flow problems should go to the Office of the Dean of Students where they may be eligible for either short- or medium-term loans.

GRADUATE COLLEGE REQUIREMENTS

The following are the general requirements of the Graduate College. *A Handbook for Graduate Students,* which is distributed to all graduate students enrolled at the University of Illinois at Urbana-Champaign, gives the requirements in more detail. Graduate students should use it as the official statement of Graduate College regulations during their graduate study on the Urbana-Champaign campus. Departments may have requirements that apply in addition to those of the Graduate College. A departmental standard higher than that of the Graduate College (e.g., the minimum grade-point average for degree eligibility) replaces the Graduate College standard.

Departmental and Graduate College policies and requirements change from time to time and may not be immediately reflected in handbooks and other publications. New degree requirements, however, cannot be imposed retroactively on continuing graduate students. If degree requirements are changed, continuing students may complete their degree programs under the requirements in effect at the time of their initial enrollment in the Graduate College. They have the option, however, of electing to be governed by the new requirements if they so desire.

A graduate student may not be awarded more than two graduate degrees from the University of Illinois at Urbana-Champaign without prior approval from the Graduate College.

Grading System

Final Grades. Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and Ab or E (failure). The grade-point average (GPA) is computed on a five-point scale with A = 5.0. Plus and minus signs do not appear on a graduate student's official transcript and are not used in computing the GPA, but they may be recorded on department records.

Other symbols used, but not included in the computation of the GPA are:

W— Officially withdrawn from a course.

Ex— Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next term

in which the student is enrolled. Failure to complete the work within this time automatically results in a grade of E by rule. If the student does not enroll the following term, the excused grade becomes an E by rule after one calendar year.

Df— Grade temporarily deferred. Used only in research and other approved courses which extend beyond one term. The time limit for the Df grade to revert to E by rule is the same as for the Ex grade except in regard to the thesis research course (499).

S or U — Satisfactory or unsatisfactory. Used as final grades only in the thesis research course (499) and in certain other approved courses.

CR or NC— Credit or no credit. Used only if students have registered for a course under the credit-no credit option with the approval of their major departments.

Ab— Absent from the final examination without an acceptable excuse. This grade counts as a failure.

Credit–No Credit Option. Subject to the restrictions of their major department and with their adviser's approval, students may register for graduate credit under the credit–no credit option. They must, however, have at least 2 units of course work in their graduate program with grades of A through C for every unit of credit–no credit work.

GPA Computation. A registered student's GPA is computed at the end of every term and reported in the Semester Grade Report, which is mailed to the student about ten days after the final day of examinations. The GPA includes units of course work with grades of A through E and Ab but not those with grades of CR, NC, Ex, Df, S, and U. The GPA does not include courses taken for semester hour credit (for example, physical education courses); nor does it include course work transferred from other universities or colleges with the exception of the Chicago campus of the University of Illinois. If a grade below C is received, a student should check with his or her adviser or department to see if the course must be repeated (a student may also choose to repeat a course). In either case, the repeated courses are ignored in the computation of a graduate student's GPA and the accumulated credits toward a degree.

Minimum GPA. Students are required by the Graduate College to maintain a minimum GPA of 3.75 in order to continue in an advanced degree program. Many departments, however, demand a minimum of 4.0 or higher, and when they do, their minimum becomes the minimum enforced by the Graduate College.

Students who complete 3 or more units of graded course work with an average of less than the minimum will receive a warning letter from the Graduate College. If after the completion of 3 additional units of graded course work, a student's GPA has not been raised to or above the required minimum or if the GPA falls below it at any time thereafter, the student will be placed on limited status. If the student's average does not meet the minimum requirement at the end of the first term on limited status, he or she will be prohibited from further registration.

Advisers and departments take factors other than satisfactory grades into consideration in determining qualifications for advanced degrees. An adequate GPA does not in itself ensure continuance in an advanced degree program.

Records maintained by departments often record deferred and plus and minus grades as well as written evaluations by instructors. These factors along with other skills and aptitudes are taken into consideration in departmental decisions about permitting students to continue in master's and doctoral programs.

Credit

Graduate Credit. Graduate credit at the University of Illinois at Urbana-Champaign is measured in terms of units with 1 unit equal to approximately 4 semester hours. Generally, courses in the 300 series carry graduate credit and are open to both graduate and undergraduate students. Courses in the 400 series, with the exception of some courses such as foreign language, carry graduate credit. Enrollment in these courses is restricted to graduate students.

Proficiency Examinations. Credit earned by passing proficiency examinations cannot be applied to the requirements for advanced degrees, but such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in areas considered important to a student's area of study. Proficiency examinations will be recorded only if the student is registered at the time of the examination. These examinations are usually given without cost to the student, but a fee may be charged to defray the cost of examinations prepared by agencies outside the University. Students should consult their advisers before applying for proficiency examinations.

Credit for Work Completed Elsewhere. Students who have completed graduate work elsewhere within the last five years but have not applied the credit toward any advanced degree, may request the credit earned for that work be applied to a degree at the University of Illinois at Urbana-Champaign. Students may request that such credit be accepted by submitting petition forms accompanied by official transcripts after successfully completing at least 2 units of graduate work on the Urbana-Champaign campus. Credit for a master's degree completed at the University of Illinois or at another institution cannot be used as partial fulfillment of the requirements for a second master's degree. If a student has earned a master's degree at another university and then completed additional course work before enrolling at the University of Illinois, that student may petition to transfer credit for that additional work provided, of course, that it was done at an accredited institution. Students having a master's degree are considered to have completed the first stage of their doctoral program unless their department stipulates otherwise. It should be stressed, however, that all doctoral candidates, regardless of transfer credits or a master's degree completed elsewhere, must complete 16 units in residence on the Urbana-Champaign campus or in courses meeting in other locations which have been approved by the Graduate College for graduate credit.

Research Credit and 499. The time devoted to research is recorded by registration in 499 (thesis credit) or in 400-level courses with such titles as "Independent Study" or "Special Topics." Registration in 499 indicates that the student's research is expected to result in a thesis in partial fulfillment of the requirements for a master's or doctoral degree. Therefore, all students registering in 499 should do so only with full departmental approval. Registration in 499 is required if a thesis is being completed as a degree requirement.

Extramural Courses. Graduate courses are offered by members of the University faculty at various centers throughout the state. Pamphlets listing these courses

can be obtained from the Office of Continuing Education and Public Service. Extramural courses are considered as work in residence if they are approved for graduate credit by the department offering the course and the Graduate College. Credit earned in extramural courses can be applied toward an advanced degree only if the courses are approved in advance by the adviser and constitute part of a well-integrated program.

The units of credit required for the master's degree must be earned in courses meeting on the Urbana-Champaign campus or in courses approved by the Graduate College for offering at off-campus locations. Credit for extramural courses can be applied to the second stage of a doctoral program only within the limits of campus residency expected by the departments offering the degree.

Correspondence Courses. Credit for correspondence courses cannot be applied toward an advanced degree but can be used to fulfill prerequisites or remove deficiencies. A list of correspondence courses is available from the Office of Continuing Education and Public Service.

Requirements for the Master's Degree

The Graduate College requires a minimum of 8 units of credit for the master's degree. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. Credit applied toward the degree must be earned in courses meeting on the Urbana-Champaign campus, the Chicago campus, or in courses meeting in other locations and approved by the Graduate College for graduate credit. Master's degrees are conferred in May, August, October, and January. Master's candidates must complete all degree requirements, under normal circumstances, within five years after their first registration in the Graduate College.

Some departments require a final examination for the master's degree. Individual departments also determine master's degree thesis requirements. Some departments require or recommend a thesis, but others ask for a "substantial research paper," or only require the minimum 8 units of course work. Thesis credit is earned in courses numbered 499 in each department. No more than 3 units of 499 can be applied to the master's degree and in some departments only 2 units.

Requirements for the Doctoral Degree

Credit and Residence. Doctoral programs are divided into three stages, as described below, and must include a minimum of 24 units of credit. At least 16 units, including thesis credit, must be earned in courses meeting on the Urbana-Champaign campus, at the Chicago campus, or in other locations which have been approved by the Graduate College for graduate credit. After the residence requirement has been fulfilled, a student who plans to leave campus may petition the Graduate College for permission to register in absentia for thesis credit.

Stage I — The master's degree or its equivalent (8 units, or 32 semester hours, of acceptable graduate work at this or another accredited university).

Stage II — One or more additional years devoted to course work and research in preparation for the preliminary examination, and fulfillment of the department's special requirements, if these have not been

satisfied earlier. Each department has a procedure for evaluating a student's progress toward the doctorate. This evaluation, whether by examination or other formal review, results in a decision as to whether or not a student is making satisfactory progress. This decision will be communicated in writing to the student and to the Graduate College. Such evaluation will take place no later than the end of the second year after a student enters the Graduate College. In some departments, this evaluation may take the form of a qualifying examination which a student must pass before entering Stage II of a doctoral program. Passing the preliminary examination marks the end of Stage II.

Stage III — Research and other activities culminating in an approved dissertation and final oral examination. Continuous registration, excluding summer sessions, should be maintained until a student has completed the credit requirement for the doctoral degree. If a student at this stage cannot maintain continuous registration, he or she must apply for readmission in order to continue doctoral study. Registration in 499 (thesis credit) is also required for the term in which a student takes the final examination, regardless of when the thesis will be deposited with the Graduate College or when the degree will be conferred.

Time Limit. Doctoral candidates must complete all degree requirements within seven years after their initial registration in the Graduate College. Those entering directly into Stage II, with a master's degree from another university or with a significant lapse of time since earning a master's degree on this campus, have six years in which to complete degree requirements.

Foreign Language Requirement. Each department establishes its own foreign language requirement; some allow for substitution of research skills in computer programming language or statistical analysis.

Preliminary and Final Examinations

Preliminary examinations taken at the end of Stage II of doctoral programs may be oral, written, or both, depending on the department's policy. Final examinations are oral and public.

The dean of the Graduate College appoints doctoral committees, at departmental request, to administer preliminary and final examinations. These committees must be composed of three or more members of the graduate faculty.

Decisions of the committees for both preliminary and final examinations must be unanimous. Departments outline their policies regarding preliminary and final examinations as part of the descriptions of their advanced degree programs and requirements which are distributed to graduate students in the department.

Theses

All candidates for the Ph.D. and candidates for most other doctoral degrees are required to write a thesis. Individual departments may have special requirements in this respect. In addition, all completed theses must be acceptable for deposit in the Graduate College; a thesis that fails to meet Graduate

College standards will be rejected. The thesis must be the work of a single author.

Before the degree is conferred, a student may find it desirable or expedient to publish some of the findings which will later be incorporated in the thesis. If this is done, an appropriate acknowledgment of the earlier publication should be included in the thesis. The Graduate College encourages such publication, but the thesis may not be published in its entirety before all degree requirements have been met.

If thesis research involves the use of human subjects, warm-blooded animals, hazardous materials or procedures, or PLATO services, the student must comply with the University's policies and procedures governing such work.

Because all theses are made available to the public, a thesis containing classified material, i.e., material deemed nonpublishable under Federal Security Regulations, cannot be accepted.

Advanced Certificate

Some departments, such as those in the College of Education, offer advanced certificates for those students who are interested in additional professional training beyond the master's degree but who are not planning to obtain the doctorate. These programs usually require the completion of 8 units of course work beyond the master's degree. Information concerning specific advanced certificate programs is available from departmental offices.

Programs of Study

The graduate programs offered by the Graduate College, through the various divisions, schools, institutes, centers, and departments of the University of Illinois at Urbana-Champaign, are described on the following pages, as well as the areas of specialization within these programs. Included also are the offerings of several interdisciplinary areas of concentration, such as population studies, environmental studies, American civilization, and African, Asian, Russian, and Latin American area studies.

The minimum requirements for admission and other requirements for graduate degrees are given for each program. The prospective student is reminded that he or she is seeking admission to the Graduate College of the University of Illinois at Urbana-Champaign and cannot be admitted to the college or to a particular academic department offering programs leading to advanced degrees without satisfying the admission requirements of both. Likewise, both departmental and Graduate College requirements must be met before an advanced degree is awarded by the University of Illinois at Urbana-Champaign. If departmental requirements are higher than the minimum Graduate College requirements, e.g., for continuation in a graduate degree program and the awarding of the degree, the higher standard applies.

The University of Illinois at Urbana-Champaign *Courses Catalog,* published biennially, lists all the undergraduate and graduate courses offered at the Urbana-Champaign campus. A listing of courses offered each term is published in the *Timetable*, issued in April for the fall semester, in March for the summer session, and in October for the spring semester. Copies of the *Courses Catalog* and *Graduate Programs* catalog are for sale through the Illini Union Bookstore, 715 South Wright Street, Champaign, Illinois 61820. Copies can also be purchased by mail from the bookstore. The *Timetable* is available free of charge at the information desk of the Illini Union. The graduate application for admission packet is available free of charge from the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820.

ACCOUNTANCY

Head and Director of Graduate Studies: F.L. Neumann

Correspondence and Information: Head of the Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: N.M. Bedford, R. Boland, G.D. Brighton, I. Bull, H.P. Holzer, O.E. Johnson, Y. Kwon, J.C. McKeown, F.L. Neumann, H.M. Schoenfeld, I. Solomon, L. Tomassini, E. Willis, V.K. Zimmerman

Associate Professors: P.J. Beck, M.H. Berry, C.E. Brown, J.S. Chandler, T.J. Frecka, K. Hreha, R.W. Jamison, P.A. Silhan, R.E. Ziegler

Assistant Professors: J. Davis, N. Desmond, W. Dilla, R. Greenberg, S. Greenberg, W. Jung, T. Liang, T. O'Leary, T. Omer, S. Reiter, F. Sharp, D. Ziebart

Graduate Degree Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science (M.A.S.) and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the M.A.S. degree requirements can be completed in one year. For nonbusiness graduates, the M.A.S. degree can be earned in two years. The Ph.D. degree takes approximately three to four years of full-time study and research.

Admission. All applicants, native or foreign, are required to take the Graduate Management Admission Test. This test should be taken early enough to ensure that the results will be available to the department prior to action on admission. The admission requirements of the Graduate College also apply. In addition, all foreign applicants must take the Test of English as a Foreign Language.

Master of Accounting Science. The Master of Accounting Science degree provides a two-year program for those with little or no background in accounting or as little as one year's study for those who wish to expand on their undergraduate degree in accountancy or other business fields. All candidates are required to complete at least 8 units of course work. At least 5 units must be at the 400 level; 4 units must be in accounting; and of these 4 units, 3 are specified and 1 is elective. The remaining 4 units are general electives available for meeting the individual student's plans. For example, the student may use some or all of them to develop an area of specialization, such as auditing, taxation, information systems, financial accounting, managerial accounting, not-for-profit accounting, and international accounting. A student's program is individually developed in consultation with a faculty adviser. No thesis is required, although the student may elect to write one.

To be eligible to complete the M.A.S. program in 8 units, a student should have completed an equivalent of the undergraduate curriculum in accountancy at the University of Illinois at Urbana-Champaign including the following: at least 21 hours of undergraduate work in accounting; a course in general economic theory, in intermediate microeconomics, in computer programming and applications, and in each of the functional fields of business; two courses in statistics; and courses including finite mathematics, linear algebra, and calculus.

A student with little or no business and accounting background is required to complete up to an additional 8 units of work. In the first year of this two-year program, a student takes four specified graduate courses in accountancy. Depending upon his or her background, the student also enrolls in courses in statistics, economics, mathematics, computer programming, and the functional areas of business. A student who already meets any of the requirements of the two-year program receives some credit toward the total 16-unit requirement. In the second year, the requirements are those for all M.A.S. students, as described above.

Master of Science in Accountancy with Specialization in Taxation. The department also offers a separate masters degree in taxation. Students who have been admitted into the M.A.S. program may transfer into the M.S. (taxation) program. The program

combines required courses in taxation with electives, both within and outside the department. The total program consists of 8 units of course work, of which at least 6 units must be in taxation.

Doctor of Philosophy. Applications for admission to the doctoral program, supported by three letters of recommendation, must be approved by the department admissions committee, which may require an oral or written examination. For students with a bachelor's degree and adequate background in appropriate areas, the requirements for the Doctor of Philosophy degree include the following: credit in micro- and macroeconomics; two courses in behavioral science or financial economics; two courses in statistics; five minor area and research technique courses (four of which must be nonaccounting courses); four accounting courses; and the thesis. The student's doctoral program is determined in consultation with a faculty advisory committee. The student's tentative plans for the doctoral thesis serve as a guide in planning the program.

In addition, the candidate must pass written and oral preliminary examinations and an oral final examination on the doctoral thesis. In the preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory in both its external and internal dimensions and of research methods; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in the required areas of economic theory, quantitative methods, and behavioral science or financial economics. Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the accountancy graduate program.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to help accounting faculty and students from other countries come to the University of Illinois at Urbana-Champaign for study and research in accountancy.

The Office of Accounting Research (OAR) was established in 1983 as the research arm of the Department of Accountancy. The mission of OAR is divided into three distinct parts: 1. Identify seminal programs that would benefit from attention. The ultimate goal is to generate ideas and concepts to help the development of the accounting discipline. 2. Support major research by providing guidance and resources. 3. Disseminate research findings to both the academic and professional community (i.e., practitioners, corporate executives, educators, and regulators).

ADVERTISING

Head of the Department: K.B. Rotzoll

Correspondence and Information: Director of Graduate Studies in Advertising, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801.

GRADUATE FACULTY

Professor: K.B. Rotzoll

Associate Professors: J.E. Haefner, K.M. Lancaster, T.C. O'Guinn, T.K. Srull

Assistant Professors: S.E. Middlestadt, J.A. McCarty, S. Shavitt

Graduate Degree Program. The Department of Advertising offers graduate work leading to the Master of Science degree. For the program leading to the Doctor of Philosophy in Communications, see page 79.

Admission. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an accredited institution of recognized standing.

All applicants are required to submit results from either the Graduate Record Examination or the Graduate Management Admission Test and are required to attach to their applications a short essay indicating why they want to take graduate work in advertising. The Graduate College admission requirements also apply.

Master of Science. Candidates for the M.S. degree must complete at least 9 units. Students with an undergraduate major in advertising can usually earn the M.S. degree in one academic year and one summer session if they take a full course of study. Applicants without an undergraduate major in advertising may be required to take up to nine additional background courses in addition to the 9 units.

At the time of admission, students will be advised of the probable number of units required for graduation. At the time of registration advising, students will be informed of the exact number of units needed to fulfill the M.S. requirements.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Acting Head of the Department: S.M. Yen

Correspondence and Information: Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, 104 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.E. Bond, J.D. Buckmaster, H.H. Hilton, C.O. Hopkins, A.I. Ormsbee, J.E. Prussing, L.H. Sentman, S.S. Wang, S.M. Yen, A.R. Zak

Associate Professors: H.O. Barthel, R.A. Beddini, L.A. Bergman, B.A. Conway, T.A.W. Dwyer, K.D. Lee, K.R. Sivier

Assistant Professors: N.S. Namachchivaya

Graduate Degree Program. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Typical areas of concentration are aerodynamics, computational fluid dynamics, structural dynamics, aeroelasticity, stochastic dynamics, combustion and propulsion, chemical lasers, optimal orbit analysis, guidance and control, space mechanics, and solar and wind energy.

Admission. The prerequisite for graduate study normally is the equivalent of the undergraduate courses required at the University of Illinois at Urbana-Champaign for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Admission requirements of the Graduate College apply.

Master of Science. Candidates for the degree of Master of Science are required to complete a minimum of 8 units of credit, 7 units of course work and 1 unit of thesis credit. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in aeronautical and astronautical engineering. For those students terminating their studies with the M.S. degree, a nonthesis option is available by departmental petition. Those not writing a thesis are required to complete a minimum of 9 units of credit. At least four units must be 400-level courses, and 3 of those 4 units must be in aeronautical and astronautical engineering.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of Doctor of Philosophy. Each student plans a program in consultation with a departmental adviser. Courses offered by departments other than the Department of Aeronautical and Astronautical Engineering may be included in the major area of study when these courses are of particular value to

the work that students desire to emphasize. The major and minor programs must meet with the approval of the head of the department. Minimum requirements for the degree consist of 8 units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from 8 units of thesis research. A reading knowledge of one foreign language is optional. Students who do not elect the foreign language option must complete a minimum of 10 units of course work for the Ph.D. degree beyond the M.S. degree requirements. Of the total Ph.D. course work requirements, at least 6 units must be at the 400 level and 4 of these 6 units must be in aeronautical and astronautical engineering.

AFRICAN STUDIES

Director of Graduate Studies: D. Crummey

Correspondence and Information: Director of the Center for African Studies, University of Illinois at Urbana-Champaign, 1208 West California Street, Room 101, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. Crummey, J.F. Due, J.M. Due, R. Hay, B. Kachru, R. Kanet, M. Kenstowicz, C. Kisseberth, D. Shimkin, A. Sofranko, C. Stewart, G. Yu

Associate Professors: E. Accad, E. Bokamba, A. Glaze, I. Kakoma, C. Keller, D. Prochaska, Y. Scheven

Assistant Professors: S. Ambrose, T. Bassett, M. Bowen, F. Cassimjee, A. Deck, A. Gottlieb, V. Hoffman-Ladd, W. Martin, M. Saul

Graduate Degree Programs. Graduate minors in African studies are administered by the director of the Center for African Studies. African studies graduate programs complement and supplement major work which students carry out within their primary disciplines. Application for admission to graduate study should be made through the appropriate department.

Minor for the Master's Degree. A candidate for the master's degree who elects African studies as a minor must secure approval from the center and must complete at least 2 units of graduate credit from the courses approved by the center. Among the fields in which courses are available are: agricultural economics, anthropology, art history, comparative literature, economics, education, French, geography, history, linguistics, political science, and sociology.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects African studies as a minor must secure approval from the center and must earn at least 4 units of graduate credit in approved courses in at least two departments. Courses are available in the fields listed above.

Financial Aid. Each year the center is generally able to assist financially a limited number of graduate students in area studies through awards of Foreign Language and Area Studies Fellowships.

AGRICULTURAL ECONOMICS

Acting Head of the Department: Donald L. Uchtmann

Correspondence and Information: Head of the Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 305 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.B. Baker, P.J. Barry, R.J. Burdge, D.L. Chicoine, J.M. Due, D.E. Erickson, L.P. Fettig, H.D. Guither, L.D. Hill, R.A. Hinton, R.M. Leuthold, D.A. Lins, J.W.

Robinson, S.B. Salamon, S.C. Schmidt, J.T. Scott, W.D. Seitz, A.J. Sofranko, S.T. Sonka, R.G.F. Spitze, C.R. Taylor, J.C. van Es
Associate Professors: J.B. Braden, P. Garcia, M.R. Grossman, R.J. Hauser, S. H. Johnson
Assistant Professors: A. Bouzaher, J.S. Eales, R.L. Farnsworth, R.H. Hornbaker, M.A. Hudson, G.V. Johnson, C.H. Nelson, G.C. Nelson, K.G. Stamoulis, S.R. Thompson, L.J. Unnevehr

Graduate Degree Programs. The Department of Agricultural Economics offers courses leading to the Master of Science and Doctor of Philosophy degrees. Areas of concentration and specialization are offered in agricultural finance, agricultural and food policy, farm management and production economics, international agricultural economics, marketing and agricultural prices, natural resource economics, quantitative and research methods, and rural community development. Rural community development has an emphasis on either agricultural economics or rural sociology.

Master of Science.
Admission. Graduate College admission requirements apply. Applicants are favorably considered for admission if they are adequately prepared for advanced study as demonstrated by their previous program of study and their scholastic record. Students having less than 12 semester hours of agricultural economics or economics may be required to take additional courses to adequately prepare themselves for graduate studies. Students who desire to specialize in rural community development with the rural sociology emphasis should have had a minimum of 6 semester hours of rural sociology or sociology.

The minimal 8-unit program must include 2 units of economics, at least 1 of which must be economic theory; 4 units of agricultural economics, including thesis credit; 1 unit in quantitative methods and research methodology that could also fulfill part of the economics or agricultural economics requirement; and 2 units of open electives. At least 4 units must be in 400-level courses, 2 of which must be agricultural economics. No more than 2 units of thesis credit can be included in the 8-unit program. The required thesis may be waived under certain circumstances. Students are examined orally on the thesis and/or a general knowledge of their field to determine their qualifications for the master's degree.

Doctor of Philosophy.
Admission. Graduate College admission requirements apply. Applicants with a master's degree in agricultural economics or a closely related discipline with an outstanding scholastic record are favorably considered for admission.

The doctoral candidate must complete 8 units of nonthesis courses beyond the master's degree. The total graduate program must include a minimum of 3 units in economics other than quantitative and research methods courses, including 1 unit each of advanced 400-level micro- and macro-theory. The program must also include 1 unit each of approved courses in econometrics and in mathematical programming. The student must pass three written and one oral preliminary examinations, submit an acceptable thesis, and pass a final oral examination. A minimum of 16 units beyond the master's degree, including thesis credits, is required.

Financial Aid. University Fellowships and tuition and fee waivers are awarded by the Graduate College. Several fellowships are also awarded on the basis of competition among graduate students studying in departments in the College of Agriculture. In addition, the Department of Agricultural Economics awards several fellowships and maintains a number of part-time positions for graduate students, most of them in research. These assistantships are offered on a competitive basis among graduate students in the departmental program. For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Head of the Unit: Earl B. Russell
Correspondence and Information: Agricultural Education, University of Illinois at Urbana-

Champaign, College of Agriculture, 67 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professor: B.E. Swanson
Associate Professor: E.B. Russell
Assistant Professors: D.A. Law, E.W. Osborne
Professors Emeriti: P.E. Hemp, L.J. Phipps

Graduate Degree Program. The Master of Science program has been planned as a professional degree for students who have completed the requirements of the four-year curriculum for agricultural education or its equivalent.

Admission. The program is open only to students who have received a bachelor's degree. The Graduate College admission requirements apply.

Master of Science. Candidates must earn 8 units; 4 units in agriculture, 2 units in education, and 2 units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields. At least 3 of the 8 units must be in 400-level courses.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than 3 units from any one department. A master's thesis is optional.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for education.

Financial Aid. Assistantships and waivers of tuition and most fees are provided on a competitive basis through funds provided by the College of Agriculture and the Graduate College. Part-time positions on research projects are often available. Further information and a copy of the graduate program brochure may be obtained by writing to the address above.

Major Areas of Faculty Research Interest. Research strengths among the faculty in agricultural education include curriculum reform, program planning, change orientation of educators, problem-solving instruction, skills acquisition, extension education, youth organizations, and international agricultural education and knowledge systems.

Resources. Graduate students in agricultural education have at their disposal the considerable resources of the College of Agriculture and the campus. These include microcomputer and mainframe computer facilities, agricultural education archives for historical research, instructional resources in agricultural communications and Vocational Agriculture Service, and the Office of International Agriculture.

AGRICULTURAL ENGINEERING

Head of the Department: Roscoe L. Pershing
Correspondence and Information: Head of the Department, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 338 Agricultural Engineering Sciences Building, 1304 West Pennsylvania Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L.E. Bode, D.L. Day, C.E. Goering, J.W. Hummel, D.R. Hunt, B.A. Jones, Jr., J.K. Mitchell, M.R. Paulsen, R.L. Pershing, E.D. Rodda, G.C. Shove, J.C. Siemens
Associate Professors: L.C. Christianson, R.C. Coddington
Assistant Professors: N.L. Buck, L.K. Ewing, M.C. Hirschi, J.B. Litchfield, J.F. Reid, G.L. Riskowski

Graduate Degree Programs. The Department of Agricultural Engineering offers the Master of Science and Doctor of Philosophy degrees.

Master of Science. Admission requirements include completion of an undergraduate program equivalent to the agricultural engineering curriculum at the University of Illinois at Urbana-Champaign with at least a 4.0 grade-point average (A = 5.0) for the terms containing the last 60 semester hours of course work. Applicants whose native language is not English must present a TOEFL score of 570 or more (also see Graduate College minimum). Students may concentrate study in one of the areas of research specialization listed below. Supporting course work includes mathematics; computer science; statistics; engineering mechanics; civil, electrical, and mechanical engineering; agronomy; food science; and other appropriate fields. The completion of 8.25 units and the preparation and defense of a thesis involving an analytical or experimental investigation (which satisfies 2 units of credit) are required of all M.S. candidates except those granted a waiver of thesis. At least 3 of the units for the M.S. degree must be in 400-level courses, and 2 of these units must be in agricultural engineering. Candidates permitted to pursue a nonthesis degree must complete a minimum of 9 units.

Doctor of Philosophy. Admission is limited to individuals who have demonstrated exceptional ability through outstanding performance in obtaining the Master of Science degree and/or through a high degree of technical and professional accomplishment. Candidates must also satisfy entrance requirements for the M.S. degree program.

Opportunities for study are found in all of the areas of specialization listed below. Candidates will be required to include course work and staff consultation from the various disciplines within the University to build strong technical programs and to fulfill the standard requirements of the Graduate College. There are no foreign language requirements; however, a high degree of competence may be required in areas associated with thesis research, such as statistics, simulation, and computer programming.

Research Interests. Students may specialize in power and machinery (tillage and soil dynamics, crop production systems, pesticide application technology, finite and boundary element analysis, dynamic system simulation, engines and alternative fuels); soil and water mechanics (agricultural hydrology, drainage, irrigation, mechanics of erosion, and water quality); structures and environment (structural analysis and design, building materials evaluation, bio-processing of agricultural wastes and byproducts, environmental control for biological systems, and livestock housing systems); electric power and processing (crop conditioning, grain quality evaluation, physical properties of agricultural products, and livestock automation systems); food engineering (engineering properties of foods, sensors and controls, image processing, process development, fermentations, milling, and transport phenomenon); or general areas (alternative energy systems, and microprocessor control applications).

Financial Aid. Fellowships supported both by University and by College of Agriculture funds, are available on a competitive basis. A limited number of assistantships, normally on a half-time basis, providing both teaching and research experience, are available.

AGRONOMY

Head of the Department: L.E. Schrader

Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-201 Turner Hall, 1102 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.E. Alexander, W.L. Banwart, R.L. Bernard, C.W. Boast, C.M. Brown, S.G. Carmer, J.W. Dudley, D.W. Graffis, R.A. Griffin, H.H. Hadley, R.H. Hageman, J.E. Harper, J.J. Hassett, J.D. Hesketh, T.D. Hinesly, R.G. Hoeft, D.A. Holt, T. Hymowitz, J.A. Jackobs, I.J. Jansen, R.L. Jones, E.L. Knake, R.J. Lambert, J.R. Laughnan, M.D. McGlamery, D.A. Miller, C.D. Nickell, W.L. Ogren, T.R. Peck, D.B. Peters, M.J. Plewa, R.W. Rinne, L.E. Schrader, R.D. Seif, F.W. Slife, G.F.

Sprague, D.M. Steffensen, F.J. Stevenson, E.W. Stoller, W.M. Walker, L.M. Wax, L.F. Welch, J.M. Widholm

Associate Professors: M.A. Cole, A.G. Hepburn, M.G. Huck, E.D. Nafziger, E.B. Patterson, G.E. Pepper, A.R. Portis, J.W. Stucki, L.O. Vodkin, J.T. Woolley

Assistant Professors: P. Baveye, F.E. Below, T.J. Bicki, D.P. Briskin, R.G. Darmody, S. Hollinger, F.L. Kolb, A.L. Kriz, R.A. Liebl, R.L. Mulvaney, R.L. Nelson, K.R. Olson, E.M. Orozco, W. Roy, F.W. Simmons, R.H. Teyker, R.M. Vanden Heuvel

Graduate Degree Programs. The Department of Agronomy offers course work leading to the Master of Science and Doctor of Philosophy degrees. Great flexibility exists for planning programs in various areas, and no rigid curricula are prescribed. The following areas of specialization indicate the breadth of opportunities, although they are not mutually exclusive: biometry and data processing, crop ecology, crop evolution, crop production, environmental agronomy, environmental physics, genetic engineering, international agronomy, pedology, plant breeding and genetics, plant cytogenetics, plant molecular genetics, plant physiology and biochemistry, soil microbiology and biochemistry, solid chemistry and mineralogy, soil fertility, soil management and conservation, soil physical and colloidal chemistry, soil physics, water relations and management, and weed science.

Admission. Applicants whose highest degree is the bachelor's degree will be considered for admission to the M.S. program. Admission to the Ph.D. program will be considered for applicants with the M.S. or those who are nearing completion of that degree. Because of the diversity of programs in the Department of Agronomy, there is considerable variation in the preparation that is needed. Undergraduate training equivalent to that required at the University of Illinois at Urbana-Champaign for majors in agricultural science (plant or soil science), agronomy, crops, or soils is appropriate. For some programs, greater emphasis is given to previous training in plant sciences, chemistry, geology, or mathematics. In all cases, previous experience or other significant evidence of serious interest in crops and/or soils is expected. A grade-point average of at least 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. A candidate must complete 8 units of graduate study as approved by his or her graduate advisory committee with a grade-point average of at least 4.0, present an acceptable thesis, and pass an oral examination. At least 3 units must be at the 400 level, including at least 2 units in agronomy and at least 1 unit of course work other than Agronomy 499. An acceptable thesis is required, although the thesis may be waived by petition in unusual situations and additional course work substituted. The master's examination is oral, although written examinations may be required at the option of the examining committee.

Doctor of Philosophy. A candidate must complete a minimum of 24 units of graduate study (16 units of in-residence credit beyond the M.S., 8 units of which must be course work) as approved by his or her graduate advisory committee with a grade-point average of at least 4.0 and must pass an oral examination, which consists of a defense of the thesis and examination on such other matters as members of the examining committee may select. Written examinations may be required at the option of members of the examining committees. At least 4 units of 300- or 400-level courses outside the Department of Agronomy are required. Residence requirements are the same as those of the Graduate College.

If the graduate advisory committee requires a student to demonstrate reading competence in French, German, or other approved foreign languages, the course work requirement may be reduced by 1½ units for each foreign language (maximum of 3 units substituted). Students whose native language is not English may fulfill the requirement for one language with their native tongue, if approved by the advisory committee.

Research Interests. Excellent laboratory, greenhouse, and field research facilities are available. A network of experimental locations throughout the state and cooperative

arrangements with other states make studies possible under a wide range of environmental and climatic conditions. The department's involvement in international programs may provide opportunities to conduct thesis research abroad. Brochures are available upon request that provide more detail about the graduate program and faculty research interests.

Financial Aid. Fellowships and assistantships are available to outstanding students on a competitive basis.

AMERICAN CIVILIZATION

Graduate Degree Program. An interdisciplinary concentration in American civilization is available leading to the Master of Arts or Doctor of Philosophy degree. Students interested in this program enroll in the Department of History. Further information may be obtained from the Department of History.

ANIMAL SCIENCES

Head of the Department: W.R. Gomes

Correspondence and Information: Department of Animal Sciences, University of Illinois at Urbana-Champaign, 328 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.M. Bahr, D.H. Baker, P.J. Bechtel, L.L. Berger, M.P. Bryant, J.R. Campbell, J.H. Clark, R.G. Cragle, S.E. Curtis, P.J. Dziuk, R.A. Easter, G.C. Fahey, Jr., U.S. Garrigus, D. Gianola, W.R. Gomes, R.W. Gorden, M. Grossman, P.C. Harrison, M.F. Hutjens, A.H. Jensen, K.W. Kelley, B.L. Larson, J.R. Lodge, S.P. Mistry, J.L. Robinson, S.L. Spahr

Associate Professors: T.R. Carr, H.W. Gonyou, C.N. Graves, E.H. Jaster, D.J. Kesler, L.M. Lawrence, F.K. McKeith, N.R. Merchen, M.R. Murphy, D.F. Parrett, C.M. Parsons, R.D. Shanks, D.L. Thomas, L.H. Thompson

Assistant Professors: G.L. Czarnecki, R.L. Fernando, P.D. George, W.L. Hurley, H.A. Lewin, D.G. McLaren, J.L. Montgomery, J.E. Novakofski, D.P. Philipp, B.A. White, M.J. Wiley

Graduate Degree Programs. The Department of Animal Sciences offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Fields of specialization include animal breeding and genetics, animal behavior, biochemistry, environmental physiology, immunobiology, meat science and muscle biology, microbiology, nutrition, systems of animal management and production, and physiology of lactation or reproduction. Beef and dairy cattle, horses, poultry, sheep, swine, and a variety of companion and laboratory animals are available for study.

Admission. The Graduate College admission requirements apply. A strong background in the biological, physical, and mathematical sciences is essential preparation for graduate work in specialized areas of animal sciences. Applicants should have a strong undergraduate background in animal sciences.

Master of Science. The Master of Science in Animal Sciences may be completed with or without a thesis. Candidates are required to complete a minimum of 8 units of graduate work. At least 3 units must be in 400-level courses, 2 of which must be in animal sciences. No more than 2 units of thesis credit may be included in the program. Candidates are required to register in the Seminar during each semester of study.

Doctor of Philosophy. The doctoral candidate must complete at least 8 units of nonthesis courses beyond the M.S. degree. The program of study must include registration in the seminar during each semester of study. The student must pass preliminary examinations administered by a committee of faculty members and must also complete 8 units of thesis research and submit an acceptable thesis. The final examination is limited to a presentation and defense of the thesis research.

ANTHROPOLOGY

Head of the Department: Thomas J. Riley
Director of Graduate Studies: F.K. Lehman
Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, 607 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.J. Bareis, E.M. Bruner, C.E. Cunningham, E. Giles, H.A. Gould, D.C. Grove, D.W. Lathrap, F.K. Lehman, B. Nettl, D.W. Plath, N.E. Whitten, Jr., R.T. Zuidema
Associate Professors: J.W.D. Dougherty, P.A. Garber, C.M. Keller, L.L. Klepinger, R.B. Lewis, E. Mayer, T.J. Riley
Assistant Professors: S.J. Ambrose, A.S. Anagnost, A. Gottlieb, G.G. Pope, M. Saul, O. Soffer-Bobyshev
Professors Emeriti: J.C. McGregor, D.B. Shimkin

Graduate Degree Programs. The Department of Anthropology offers graduate work leading to the Master of Arts and the Doctor of Philosophy degrees.

Admission. A student without the equivalent of this department's undergraduate concentration may be admitted to either degree program but will be required to make up deficiencies in his or her background in anthropology. The Graduate College admission requirements apply.

Master of Arts. The master's degree can be a first stage toward the doctorate or may be used by students wishing to apply a knowledge of anthropology to some related field. A candidate for the master's degree must complete at least 8 units of graduate credit and present a thesis or paper in lieu of a thesis acceptable to two members of the graduate faculty within the Department of Anthropology. At least 3 units must be at the 400-level, and 2 of these units must be in anthropology.

Doctor of Philosophy. Requirements for the Ph.D. include 16 units of graduate course work beyond the M.A., a preliminary examination administered by the student's advisory committee, and a final examination. The preliminary examination consists of a predissertation research paper, a proposal for doctoral research, and a written examination designed by the student's doctoral committee followed by a 2-hour oral examination conducted by the same committee. The final examination is a defense of the doctoral thesis, which is also conducted by the student's doctoral committee. High proficiency in one or reading ability in two foreign languages is required; however, statistics, computer science, or similar expertise may be used to satisfy the requirements in place of one foreign language. Fieldwork is strongly recommended though not required.

Research Interests and Facilities. Courses and individualized study provide broad coverage of a sociocultural, linguistic, archaeological, and physical anthropology. The department provides special emphases in the analyses of state ideologies and cultural transformations; complex societies in transition; kinship and gender relationships; symbolism, cosmology, art, and religion; politics, economics, and ethnicity; language and culture; text and narrative; formal analysis and mathematical modeling; medical anthropology; agricultural origins, evolution, and development; hunter-gatherer adaptations; diet and nutrition; paleoecology, and paleobiology; comparative and analytical osteology; primate behavior and ecology. The department's Laboratory of Anthropology has constituent archaeological, paleoethnobotany, faunal analysis, human biology, stable-isotope, and ethnographic laboratories. The department is the headquarters of the Illinois Archaeological Survey and offers summer field school training in archaeology. Departmental funds are available for graduate students' summer field research. An archaeology field school is held at various locations in Illinois and/or Kentucky (location varies from year to year). Graduate student programs are enriched by close departmental relationships with the interdisciplinary area studies centers on campus:

Africa, East Asia and the Pacific, South Asia, Latin America and the Caribbean, Russian and East European, and with the Center for Afro-American Studies, the Women's Studies Program, Women in Development Program, World Heritage Museum, Natural History Museum, Krannert Art Museum, Research Board, and International Programs and Studies. The department recently ranked first in the United States in employment of graduates at the time of receiving doctorates. Formal agreements between the University and various governments and institutes facilitate research in many nations. Training in languages, including Quechua, Japanese, Chinese, Russian, Indonesian, Thai, Burmese, Swahili, Hausa, Lingala, Wolof, Arabic and Shona, is available. Students have ready access to the extensive computer facilities of the University and to the department's facilities which include microcomputers and mainframe computer terminals, a graphic digitizer, photographic equipment, video equipment, and other research-oriented equipment. The *Journal of the Steward Anthropological Society*, edited by graduate students, has been published since 1969.

ARCHITECTURE

Director of the School: R. Alan Forrester
Correspondence and Information: School of Architecture, 106 Architecture Building, 604 E. Lorado Taft Drive, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: J.R. Anderson, J.S. Baker, A.C. Bianchini, W. Eng, R.A. Forrester, J.S. Garner, B.L. Hutchings, R.D. Katz, S.T. Lanford, W.H. Lewis, H.J. Miller, A. Notaras, W.J. O'Connell, S. Prasad, I. Schousboe, J.H. Swing, R.L. Tavis, J.P. Warfield, D.J. Wickersheimer, C.A. Winkelhake
Associate Professors: J.G. Albrecht, M.M. Ali, D.E. Bergeson, R.J. Betts, V.V. Cafourek, W.H. Erwin, L.A. Leffers, R.E. Schmitt, J.E. Simon, R.L. Smith, H.C. White
Assistant Professors: K.H. Anthony, R.G. Ousterhout

Graduate Degree Programs. The School of Architecture offers three graduate programs, each leading to the Master of Architecture degree: Track 1, a one-year program for those holding a five-year Bachelor of Architecture professional degree; Track 2, a two-year program for those holding a four-year Bachelor of Science in Architectural Studies (or similar degree in architecture); and Track 3, a variable-length program for those holding a Bachelor's degree in any field other than architecture. Track 2 and Track 3 programs are professional degree programs accredited by the National Architectural Accreditation Board.

The School of Architecture, together with the Departments of Business Administration, Finance, Computer Science, Urban and Regional Planning, and Civil Engineering, offer graduate programs leading to the following dual degrees: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Finance; Master of Architecture and Master of Computer Science; Master of Architecture and Master of Urban Planning, and Master of Architecture and Master of Civil Engineering (Construction Management).

Admission. Admission with full standing requires a preprofessional architectural degree equivalent to the four-year Bachelor of Science in Architectural Studies from the University of Illinois at Urbana-Champaign or a five-year Bachelor of Architecture professional degree. The admission average must be at least 4.0 (A = 5.0). For those applicants who meet the degree requirements but have an admission average under 4.0, admission with limited standing may be permitted if evidence of exceptional qualifications is presented. Admission with limited standing may also be permitted for those applicants holding a degree less than equivalent to a degree from the University of Illinois at Urbana-Champaign, provided that equivalency can be established through additional course work.

Applicants are ranked and selected on the basis of undergraduate academic performance measured by admission averages determined from official college transcripts,

portfolio or brochure of applicant's past work in the architectural field, a statement of objectives, three letters of recommendation, and relevant professional work experience.

Master of Architecture (Track I). Applicants who hold the five-year Bachelor of Architecture degree are considered to have earned their first professional degree. For these students, a one-year degree program has been developed emphasizing further study in depth of one optional area of concentration, and/or participation in research identical to the final phase of the Track 2 graduate program.

A candidate admitted to the Track I graduate program must complete at least 8 units of graduate work. The candidate must spend at least two semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in one full-time academic year of study.

Master of Architecture (Track 2). The two-year professional degree program intended for those entering with a four-year baccalaureate in architectural studies, emphasizes further study in architectural disciplines, study in depth in one optional area of concentration, and/or participation in research.

Advanced study in architectural disciplines, building upon the fundamentals established in a four-year undergraduate study program, comprises the initial phase of the two-year graduate program. This initial phase is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of course work required of all candidates for the Master of Architecture professional degree.

Election of an optional area of concentration comprises the final phase of the graduate program and allows a student to devote two semesters' work to a specific field of his or her choice. The department offers optional areas of concentration in architectural design, architectural history, historic preservation and rehabilitation, housing environments, architectural management, architectural practice, architectural structures, and urban design. There is a strong shared interest in environment and behavior studies with the Departments of Landscape Architecture and Urban and Regional Planning and with the Office of Housing Research and Development. Individualized areas of concentration may also be pursued through an individual study option for which a research thesis is required.

Participation in or initiation of research is encouraged in the optional areas of concentration. For those qualified, many opportunities currently exist in departmental and interdepartmental areas. These include research opportunities within the School of Architecture based on research grants from various external funding agencies; the Office of Housing Research and development, a unit of the Graduate College; and the Small Homes Council-Building Research Council, a unit of the College of Fine and Applied Arts.

A candidate admitted with full or qualified standing to the two-year professional degree program must complete at least 15½ units of graduate work. The candidate must spend at least four semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in two full-time academic years of study.

Master of Architecture (Track 3). The variable-length professional degree program has been designed for those applicants who have a bachelor's degree in any field other than architecture. Emphasis is placed on the development of sufficient background in introductory architectural studies so that the applicant may successfully complete the equivalent of the two-year graduate program described above.

Applicants accepted into the Track 3 program will initially be admitted with limited standing. Full standing may be attained by completion of introductory architectural studies. Thirteen and one-half units of graduate work are required for completion.

The time necessary to complete the program will depend upon the nature of undergraduate course work completed by the applicant, and the optional area selected.

Master of Architecture and Master's Degree in Business Administration, Science of Finance, or Computer Science. Three double master's degree programs related to the Architectural Management Option prepare graduate degree candidates for the broad

range of management activity now developing in architectural practice. Work in the Architectural Management Option in one of these areas can lead to one of the following double master's degree combinations: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Finance; and Master of Architecture and Master of Computer Science.

For entry into these programs, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission may be made simultaneously to both units or admission to the one unit may be sought after gaining entry to the other.

A candidate entering one of these double degree programs with a four-year baccalaureate in architectural studies must complete 21½ units of graduate work, except that the Master of Architecture and Master of Computer Science degrees require 18½ units plus 9 semester hours of prerequisites in computer science. If admitted with full standing, the program may be completed in five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters.

Master of Architecture and Master of Urban Planning. This double degree program offers an opportunity to obtain an education for careers that combine the disciplines of architecture and planning. The program requires a match-up of related subject areas from each department in order to meet the requirements for each degree. These areas include: housing/community development, preservation/preservation planning, and urban design/environmental planning and land use. For entry into this program, the applicant must satisfy the admission requirements of each academic unit. Application for admission may be made either simultaneously to both units or in sequence.

A candidate entering the program with a four-year baccalaureate in architectural studies must complete at least 20½ units of graduate work and, if admitted with full standing, may complete the program in six semesters and one summer session. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work, and, if admitted with full standing, may complete the program in four semesters and a summer session.

Master of Architecture and Master of Civil Engineering (Construction Management). This double degree program offers to qualified applicants the opportunity to develop competence in a career that combines the disciplines of architecture and civil engineering construction management. For entry into this program, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission should be made to the School of Architecture. Admission to the other unit may be sought after the first semester of graduate study in Architecture.

A candidate entering the program with a four-year baccalaureate in architectural studies, must complete at least 21½ units of graduate work, and, if admitted with full standing, may complete the program in five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete 16 units of graduate work, and, if admitted with full standing, may complete the program in four semesters.

ART AND DESIGN

(Including Art Education, Art History, Ceramics, Glass, Graphic Design, Industrial Design, Metals, Painting, Photography, Printmaking, and Sculpture)

Director: E.C. Wicks

Correspondence and Information: G.W. Hardiman, Coordinator of Graduate Programs, School of Art and Design, University of Illinois at Urbana-Champaign, 120 Art and Design Building, 408 East Peabody Drive, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: P. Fehl, D. Frith, F. Gallo, L. Grucza, F. Gunter, G.W. Hardiman, J. Kaufman,

T. Kovacs, N. McFarland, B. Nettles, D. Pilcher, D. Rowan, J. Savage, R. Sterkel, E.C. Wicks, E. Zagorski, T. Zernich, J. Ziff.

Associate Professors: M. Arends, R.F. Blakley, D. Bushman, K. Carls, W. Carlson, B. DeGenevieve, J. Fineberg, S. Flack, M. Franciscono, A. Glaze, H. Maguire, C. Martens, A. Mette, K. Munakata, S. Orso, J. Rascheff, D. Socha, T. Van Laar

Assistant Professors: A. Hedeman, C. Jordan, K. Manthorne, B. Rutter, C. Thompson

Graduate Degree Programs. The School of Art and Design offers the Master of Arts in Art Education and in Art History, the Master of Fine Arts, the Doctor of Education in Art Education, and the Doctor of Philosophy in Art History. The Graduate College admission requirements apply for all programs.

Master of Arts in Art Education. The program of study leading to the degree of Master of Arts in Art Education is designed to provide advanced professional preparation for art teachers and supervisors. A minimum of 8 units of study is required for the degree. Three units must be taken at the 400 level, all of which must be in art education graduate seminars. In addition to professional courses in art education, students may elect course work in drawing, painting, sculpture, papercasting, printmaking, photography, cinematography, ceramics, glassworking, metalsmithing, and art history. Specific course selection is determined in consultation with the student's advisor. No thesis is required. While the majority of applicants to this program hold valid teaching certificates, applicants with certification-related deficiencies may be admitted to the program. However, graduate credit cannot be granted for courses taken to make up such deficiencies. Candidates must spend at least two semesters or the equivalent in residence. Applicants currently employed as teachers may apply for residence credit for summers-only enrollment.

Master of Arts in Art History. This program provides basic preparation for teaching at the college level, background in the history of art for museum work, and preliminary study for the doctoral degree. In addition to the general requirements, the prerequisite for admission is ordinarily an undergraduate degree in art history or a strong preparation in related humanistic studies. Applicants with little background in art history but who have done exceptionally well as undergraduates in other disciplines will be seriously considered. A minimum of 8 units is required for the degree. At least 6 units must be in the history of art and architecture, of which at least 4 units must be in art history graduate seminars. For those interested in art museum training, special courses in museology are offered by the staff of the Krannert Art Museum. Proficiency in French or German must be demonstrated by the end of the first year of residence. Before the degree is conferred, the candidate is required to pass an examination on the general field of art history. A thesis is required.

Master of Fine Arts. The degree of Master of Fine Arts in Art and Design with fields of specialization in ceramics, glass, graphic design, industrial design, metals, painting, photography, printmaking, and sculpture is designed to prepare qualified individuals for distinctive achievement in the professional area of their choice. Applicants should clearly indicate their intended specialization on their application for admission. A minimum of 16 units of graduate credit is required for the M.F.A. degree. Individual studio space and specialized resources essential to the acquisition of a high-quality professional education are available to students in all areas of study. A graduation exhibition of creative work is required. Candidates must spend a minimum of four semesters or the equivalent in residence.

Doctor of Education in Art Education. The program leading to the degree of Doctor of Education in Art Education is designed to prepare qualified art educators for careers in college-level teaching and research. An applicant for admission must hold a master's degree in art education or the equivalent from an accredited institution. A minimum of two years of acceptable teaching experience is required. Admission is determined by examinations, personal interviews, records of previous education and experience, and letters of recommendation. Applicants should present credentials well in advance of

their first registration. A minimum of 16 units of course work beyond the master's degree is required.

Doctor of Philosophy in Art History. The program leading to the degree of Doctor of Philosophy in Art History is designed to prepare students for scholarship and for teaching at the college level. Applicants must have the Master of Arts degree in Art History or the equivalent. Students earning the master's degree at the University of Illinois must pass the qualifying examination with a high score and write a thesis or research paper of superior quality in order to be admitted to the doctoral program. Students taking the master's degree elsewhere must satisfy the Graduate Committee on the History of Art and Architecture as to their preparation to undertake work on a doctoral level. All students must have a reading knowledge of French and German. Students normally elect to specialize and write a thesis in one of the following fields: medieval, Renaissance, baroque, modern, American, or oriental. In addition, the student will elect a minor in another art history field.

Financial Aid. Fellowships, assistantships, and tuition and service fee waivers are awarded each year on a competitive basis with consideration given to the applicant's grade-point average and, in the case of applicants for the M.F.A. programs, quality of creative work.

Resources. Resources for the graduate student in art and design include the Krannert Art Museum's excellent permanent collections and changing exhibitions; the Ricker Art Library, one of the largest art and architecture libraries in the nation; the Krannert Center for the Performing Arts; and a variety of lectures, symposiums, musical programs, dramatic productions, and other cultural events associated with a large and progressive university.

ASIAN STUDIES

(Including Arabic, Burmese, Chinese, Hebrew, Hindi, Indonesian, Japanese, Korean, Persian, Sanskrit, Thai, and Turkish)

Correspondence and Information: East Asian, Southeast Asian, and Pacific Studies: Center for East Asian and Pacific Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801. South and West Asian Studies: Program in South and West Asian Studies, University of Illinois at Urbana-Champaign, Room 381, Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: N. Aggarwal, P. Balgopal, E. Bruner, C. Cheng, S. Cohen, P. Cole, C. Cunningham, E.E. Dawn, L. Eastman, P. Ebrey, E. Giles, F. Gottheil, H. Gould, K. Gould, T. Hymowitz, R. Jennings, N. Jacobs, B. Kachru, Y. Kachru, B. Karsh, M. Kenstowicz, C. Kim, B. Kling, F. Lehman, S. Makino, A. Neghandi, B. Nettl, D. Plath, G. Porton, S. Rashid, S. Sato, P. Schran, C. Stewart, K. Taira, G. Tikku, M. Weinbaum, W. Wong, G. Yu, L. Zgusta

Associate Professors: E. Accad, B. Bognar, C. Capwell, R. Chang, P. Cole, S. Douglas, D. Goodman, H. Hock, S. Johnson, W. MacDonald, H. Maguire, C. Mulhern, K. Munakata, J. Peterson, G. Porton, T. Riley, M. Shorish, K. Southwood, C. Stewart, R. Toby, M. Wagner, M. Weinstein

Assistant Professors: A. Anagnost, A. Elhance, J. Dougherty, V. Hoffman-Ladd, W. Li, P. Gregory, R. Pandharipande, W. Pitard, G. Pope, M. Saul

Graduate Degree Program. The Center for Asian and Pacific Studies administers, in cooperation with the Program in South and West Asian Studies where applicable, a two-year program of language and area courses leading to the Master of Arts degree with regional concentrations in East Asia, Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for those intending to proceed to the Ph.D. degree in a related field and for those preparing for careers not requiring the doctorate. The Center for Asian Studies also administers a

graduate minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, Middle East, South Asia, and Southeast Asia, or a combination of two or more of these areas.

Admission. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois at Urbana-Champaign, but final selection is determined by a committee of center faculty. Students whose native language is not English must score at least 580 on the TOEFL to be eligible for admission at full graduate standing. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. Those entering without any prior training or experience, however, may be required to take, without credit toward the degree, such work as the adviser may deem necessary to make up any deficiencies.

Master of Arts. A candidate must complete 9 units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by satisfactory completion of an examination or appropriate course work, pass an oral examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers. No thesis is required.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least 2 units of graduate credit in approved courses in at least two departments outside the major department.

A doctoral candidate who elects Asian studies as a minor must earn at least 4 units of graduate credit in approved courses in at least two departments outside the major department. Also, prior to the completion of course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Head of the Department: Ronald J. Allen

Correspondence and Information: Head, Department of Astronomy, University of Illinois at Urbana-Champaign, 349 Astronomy Building, 1011 West Springfield Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.J. Allen, R.M. Crutcher, J.R. Dickel, I. Iben, Jr., J.B. Kaler, F.K. Lamb, K.-Y. Lo, D. Mihalas, T. Ch. Mouschovias, E.C. Olson, L.L. Smarr, L.E. Snyder, J.W. Truran, W.D. Watson, R.F. Webbink, K.M. Yoss

Associate Professors: L.A. Thompson, M. Norman

Assistant Professor: B. Mihalas

Professors Emeriti: J.H. Cahn, S.Rosen, G. Swenson

Graduate Degree Programs. The Department of Astronomy offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The goal of the graduate program in astronomy is to provide broadly-based training in modern astrophysics and astronomy for a small and carefully selected student body. Individually designed programs involving close contact with faculty members are encouraged, and an understanding of fundamental principles and techniques and their applications to research problems of current interest is emphasized. Students are expected to acquire a solid knowledge of modern physics as well as of general astronomy. A major objective is to maintain an exciting intellectual environment in which students can develop their scientific creativity and their enthusiasm for astronomy.

Admission. Admission decisions are made once a year in the spring. Applications for admission and financial assistance must be received by February 15. Normal entrance

requirements are a bachelor's degree in astronomy, physics, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. A minimum grade-point average of 4.0 (A = 5.0) and satisfactory scores on the Graduate Record Examination (verbal, mathematics, and advanced physics portions) are requisites for admission. Financial assistance is normally provided to graduate students.

Master of Science. Eight units of study in graduate courses are required. There are no thesis or foreign language requirements. The 8 units of course work may not include any research units (such as 490, 497, 499) except 1 unit of 492. At least 4 units must be in astronomy 400-level courses, 2 of which will be in Theoretical Astrophysics 402 and in Observational Astronomy 403. The remaining 4 units must be selected from approved courses in astronomy, physics, or mathematics, with at least 1 of these units in a 400-level course.

Doctor of Philosophy. The Ph.D. degree requires completion of 24 units in courses in astronomy and related fields (at least 8 of which involve individual study and research), satisfactory performance on a general qualifying examination taken no later than the beginning of the third year of study, demonstrated reading ability in one foreign language useful for astronomical work, and completion of an original research project culminating in a thesis publishable in whole or in part.

Financial Aid. University Fellowships are available and may be combined with part-time teaching assistantships. Most resident students are supported for their first two or three years by half-time teaching assistantships (starting salary $8,000 per academic year in 1986-87). The typical teaching assistant takes three graduate courses per semester and spends twenty-hours per week handling quiz sections in elementary astronomy courses. Teaching assistantships are responsible positions, and the concomitant duties are considered to be a valuable part of the student's educational experience. Advanced students may compete for research assistantships offered by faculty members whose research is partially supported by federal grants.

Faculty Research Interests. Research activity includes astrophysical fluid dynamics and theory of star formation; radiation hydrodynamics; observational and theoretical investigation of the solar system (comets, planets, cosmochronology); stars (stellar structure and evolution, gravitational collapse, nucleosynthesis, novae, supernovae, stellar atmospheres, binaries, stellar statistics, pulsars); the interstellar medium (planetary nebulae, molecular clouds, cosmic rays, supernova remnants, galacti structure); extragalactic systems (galaxies; their structure, evolution, and dynamic behavior; quasars); and cosmic magnetic fields.

Astrophysics is also a strong research interest of about six faculty members in the Department of Physics. Current activity in physics centers on the physics of neutron stars, white dwarfs, compact X-ray sources, and super-nova ejecta, with broad-ranging interests in the application of modern physics to astronomy. Students in astronomy may select thesis supervisors in the Department of Physics as well as in the Department of Astronomy.

Research Facilities. The department has a share in a millimeter radio interferometer system in Northern California (being developed jointly with UC Berkeley and Maryland). A 40-inch diameter reflecting telescope equipped with a CCD is located on Mt. Laguna in Southern California. It is operated jointly with San Diego State University which also operates 16-inch and 24-inch telescopes occasionally used by University of Illinois faculty and students. Transportation costs are normally provided. The department also purchases time on optical telescopes operated by other universities. Both optical and radio astronomers frequently obtain observing time on telescopes at national observatories at Kitt Peak, Cerro Tololo, Green Bank, and Socorro. Computations are performed on a variety of university computers including an IBM 360/75, a CDC CYBER 175, and a CYBER 174 accessed via remote terminals in the Department of Astronomy. Simultaneous time sharing and batch processing with unusual speed are features of the computational system, which is among the most advanced university-based systems in the nation. A local area network including VAX and SUN computers for interactive

image processing is available in the department. This LAN also provides access to the CRAY at the National Center for Supercomputing Applications on the campus; this computer is used for production data processing (radio synthesis imaging) as well as theoretical modeling.

ATMOSPHERIC SCIENCES

Head of Department: M. Mak

Correspondence and Information: Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, 102 Atmospheric Science Building, 105 South Gregory Avenue, Urbana, Illinois 61801.

GRADUATE FACULTY

Professors: K.V. Beard, P.J. Lamb*, M. Mak, Y. Ogura, T. Sasamori, R.G. Semonin*, J.E. Walsh, R.B. Wilhelmson

Assistant Professors: K.P. Bowman, M. Ramamurthy, R.M. Rauber, W.A. Robinson

*Adjunct faculty from Illinois State Water Survey

Graduate Degree Program. Graduate programs leading to the Master of Science and Doctor of Philosophy degrees are offered.

Admission. Applications for admission to this program must satisfy the general requirements for admission to the Graduate College. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied mathematics. There is no foreign language requirement.

Master of Science. The requirements for the degree of Master of Science in Atmospheric Sciences correspond to the general requirements of the Graduate College for the M.S. degree with the additional requirement of a minimum of 4 units to be taken in graduate courses in atmospheric sciences, excluding the thesis (499). Therefore, the total requirements are 8 units, 3 of which must be from courses numbered in the 400 series and 4 of which must be in atmospheric sciences. A written thesis, which may account for 1 or 2 units of credit, is also required. Further information on exact degree requirements can be obtained from the department.

Doctor of Philosophy. All candidates for the Ph.D. degree must satisfy the general requirements of the Graduate College and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet which may be obtained from the department.

Financial Aid. Financial aid is available in the form of research and teaching assistantships, University Fellowships, and waivers of tuition and service fees.

Research Interests. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the physics of aerosol and precipitation; precipitation chemistry; observational, theoretical, and modeling studies of clouds and severe storms; synoptic and mesoscale meteorology; numerical weather prediction; weather modification; four-dimensional data assimilation; stratospheric dynamics; low-frequency variability; nonlinear atmospheric dynamics; climate variability and climate modeling; monsoonal circulations; polar meteorology and oceanography; tropical meteorology; atmospheric radiative processes; ozone climatology; radar and satellite meteorology; and crop yield–weather relationships.

Research Facilities. Current weather information is available for teaching and research. Weather facsimile charts are received continuously from the National Weather Service,

and satellite imagery is received hourly through the department's UNIFAX II GOES receiver. The department also receives current surface and upper air data in digital form by satellite transmission. These data are processed and stored on a state-of-the-art graphics and image system so that both students and faculty can retrieve and display them, as they desire, using interactive display programs.

The system, built around VAX 11/780 and MicroVAX II computers, can also be used to display research data generated by numerical models or taken in special observational programs. Several graphics terminals are available, including a Tektronix 4025 and a high-resolution (1024 x 1024) IVAS color workstation. Hard copy can be made using a line printer, printer/plotters, laser printers, and 16 mm or 35 mm color film.

Students and faculty have access to several other computer systems through the VAX computers and terminals located within the department. A local ethernet within the Atmospheric Sciences Building is attached to the campus fiber-optic network, which provides access to the powerful campus computers and to the CRAY X-MP of the National Center for Supercomputing Applications. This network also has satellite and land line links to other computing centers, including the computing facility at the National Center for Atmospheric Research. This center maintains two CRAY supercomputers and has comprehensive atmospheric data banks for support of research.

BUSINESS ADMINISTRATION

Head of the Department: Frederick W. Winter

Correspondence and Information:

Ph.D. and M.S.B.A.: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820.

M.B.A.: M.B.A. Program Office, University of Illinois at Urbana-Champaign, 315 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: C. Blair, R.V. Evans, D.M. Gardner, R.M. Hill, H. Hinomoto, A. Huff, J. Kindt, J.K. Murnighan, A. Negandhi, G. Oldham, W.J. Primeaux, D.M. Roberts, K.M. Rowland, G.R. Salancik, S. Sudman, H. Thomas, D.A. Whetten, F.W. Winter

Associate Professors: S. Cohen, I. Duhaime, R. Engelbrecht-Wiggans, H. Leblebici, G. Monahan, J. Porac, Z. Ritz

Assistant Professors: A. Basu, L. Buchanan, M. Hastak, M. Leatherwood, P. Rechner, M. Shaw, C. Simmons, D. Sudharshan, M. Tang, J. Yu

Graduate Degree Programs. The College of Commerce and Business Administration offers graduate programs leading to the degrees of Master of Business Administration, Master of Science in Business Administration, and Doctor of Philosophy in Business Administration. The M.B.A. program, because of widespread appeal and faculty participation, is administered by the College of Commerce and Business Administration. The Ph.D. and M.S.B.A. programs are administered by the Department of Business Administration. The department also offers, in cooperation with other departments and colleges, a variety of interdisciplinary programs leading to such combined degrees as the Juris Doctor and Master of Business Administration, the Master of Architecture and Master of Business Administration, and the Bachelor of Arts (or Science) and the Master of Business Administration for superior undergraduates. Additional joint degree programs are the Master of Science in Electrical Engineering and the Master of Business Administration; the Doctor of Medicine and Master of Business Administration; the Master of Arts in Public Administration and Master of Business Administration; the Master of Computer Science and Master of Business Administration; and the Master of Industrial, Mechanical, and General Engineering and Master of Business Administration.

Admission. Graduate admission depends on many factors relating to demonstrated academic competence and potential of candidates. Our students are among the top 10

percent of all United States undergraduates scoring on the national Graduate Management Admission Test (GMAT) for management schools; their grade-point averages rank ever higher, and about 60 percent have had full-time work experience. Persons seeking admission should have completed one year of college-level calculus or be prepared to take a noncredit mathematics course upon entering the program. In general, admission is based on a person's (1) previous academic accomplishment; (2) demonstrated potential as indicated by performance on the Graduate Management Admission Test; (3) statement of professional and academic goals; and (4) letters of recommendation from professors, supervisors, or colleagues. Undergraduate majors can be from any area of study; more than 65 percent of our M.B.A students have a nonbusiness background.

Master of Business Administration. The M.B.A. degree is designed as a general degree, preparatory to assuming administration positions, to be integrated with other technical and professional skills. The program requires 16 units, which can be completed in two years. The program may be started in the fall term only.

The program has three components: administrative foundations, managerial functions, and professional concentrations. Course work involving the foundation and functional courses may be exempted, provided electives are substituted. Professional concentrations may be elected from any curriculum in the University that is administratively justifiable. Students are also required to enroll in noncredit computer short courses during the first semester of the program.

Foundations. Six courses form the theoretical grounds for the M.B.A. program. These include quantitative methods (statistics and operations research), behavioral and social science (human and organizational behavior), and economics (managerial and macroeconomics).

Functions. Six courses introduce the functional areas of management in most modern organizations. The functional area courses include: marketing, managerial accounting and control, financial management, operations management, business law, and strategic management.

Concentrations. Four courses are elected by students to integrate, develop, and refine their management interests. Students from joint degree programs take their concentrations in their specialty areas—law, architecture, medicine, engineering, or public administration. Other students concentrate in such business areas as finance, international marketing, managerial accounting, consumer and industrial marketing, organizational development, and management information systems.

Juris Doctor and Master of Business Administration Program. This program, leading to the J.D. and M.B.A. degrees in four years, is designed to provide training for careers in which administration and law significantly overlap. One application form and one fee are required. Each unit has its own policies with respect to entrance requirements, degree requirements, grades, examinations, etc.

The student takes the first-year law curriculum in the first year and the business administration curriculum during the second year. The student takes courses in both colleges during the third and fourth years. The program requires a student to take a minimum of 74 hours of law courses and 11 units (equivalent to 44 semester hours) of business administration courses.

Master of Architecture and Master of Business Administration. This program is designed to provide training for careers in which management and architecture overlap. Applicants to the program must be admitted to both the School of Architecture and the Department of Business Administration. One application form and one fee are required. Each unit has its own policies with respect to entrance requirements, grades, examinations, etc.

This double master's program enables the student taking a full load each semester to fulfill the requirements for both degrees by completing a total of 21½ units in five semesters.

Other Joint Degree Programs. In addition to law and architecture, the department offers several other professional programs that enable students to prepare for two professional areas simultaneously. The Master of Science in Electrical Engineering, Industrial Engineering, Mechanical Engineering, and General Engineering, and Master of Business Administration leads to the separate degrees of M.S.E.E. and M.B.A., M.S.I.E. and M.B.A., and M.S.M.E. and M.B.A. and M.S.G.E. and M.B.A. These programs are designed for careers in professional engineering offices or careers in business that require working extensively on engineering applications. The normal degree requirements of 16 units for the M.B.A. degree and 8 units for the M.S.E.E. degree are reduced by a total of 6 units through an exchange of credits between departments. For information on the M.S.E.E. program, write to Head of the Department, Department of Electrical Engineering, 155 Electrical Engineering Building, 1406 West Green Street, Urbana, Illinois 61801.

The M.S.I.E./M.B.A. requires a total of nineteen units, the M.S.M.E./M.B.A. nineteen units, and the M.S.G.E./M.B.A. eighteen units. For information on the M.S.I.E. and M.S.M.E. programs, write to Head, Department of Mechanical and Industrial Engineering, 144 M.E. Building, 1206 W. Green Street, Urbana, Illinois 61801. For the M.S.G.E./M.B.A. program, write to Head, Department of General Engineering, 117 Transportation Building, 104 South Mathews, Urbana, Illinois 61801.

The Medical Scholars Program, leading to the separate degrees of M.D. and M.B.A., is designed for the medical doctor who anticipates administrative and management responsibilities. In addition to the requirements for the M.D. degree, the program requires 12 units from business administration. The program can be completed over four full years (including three summers). For information on the program, write Coordinator, Medical Scholars Program, College of Medicine at Urbana-Champaign, University of Illinois School of Clinical Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

The combined Master of Computer Science and the Master of Business Administration program is designed for computer scientists who want to be professional managers. The joint program allows students to earn both degrees in three years. Additional information about the program is available from the Head of the Department, Department of Computer Science, 1304 West Springfield Avenue, Urbana, Illinois 61801.

In the Bachelor of Arts (or Bachelor of Science) and Master of Business Administration program, the College of Liberal Arts and Sciences and the Graduate College have created a joint baccalaureate and M.B.A. degree program. Qualified students earn both bachelor's and M.B.A. degrees within five years. Undergraduate and professional education are integrated through careful course planning, beginning in the sophomore year. The student applies to the program during the junior year. During the fourth year, students complete required M.B.A. graduate courses as electives for their baccalaureate program.

Master of Science in Business Administration. The Master of Science in Business Administration is a 12-unit master's program. The focus is on preparation for advanced study in the doctoral program or for a technical or research position in industry or government. The course work can usually be completed in one and one-half years.

The program core for this degree consists of fundamental courses in statistics, operations research, human and organizational behavior, managerial economics, and macroeconomics. Four courses that will constitute the major area of specialization are to be chosen from management science, organizational behavior, management information systems, operations management, marketing, international business operations, business economics, and strategic management and policy. Two courses that will constitute a minor area can be independent research courses or relevant courses offered within or outside the department. A thesis may be prepared in place of the two courses.

Master of Science in Business Administration for International Managers. The M.S.B.A. for International Managers is a fourteen-month master's degree program designed to meet the management development needs of organizations involved in international business. It is intended for experienced international managers and administrators who want to earn an advanced degree while gaining valuable experience

in the actual world of American business. Students typically are experienced managers who possess unusual potential for future achievement in international business.

In addition to formal course work, students participate in a series of management development seminars which provide an overview of American business concepts and practices. Business and industry field trips, seminars with American executives, and other special activities provide another unique dimension to the program.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration. Doctoral students can specialize in marketing, organizational behavior, decision and information sciences, international business, business economics, and strategic management and policy. The program is intensive, flexible, and adapted to individual needs.

Each student's program entails sufficient study and preparation to achieve the following: (1) competence in a common core covering substantive and research methods courses which are formulated by the faculty in each area; (2) in-depth expertise in a major area; (3) expertise in at least one area in addition to the chosen major area, with this minor area selected from within or outside the department; (4) teaching competence; (5) research or problem-solving competence.

Competency is determined by comprehensive written and/or oral examinations. Following successful completion of all course work and comprehensive examinations in major and minor areas, the student must propose and gain approval of a thesis topic at a public colloquium. The final program requirement is the successful oral defense of the thesis.

For persons entering the program from an undergraduate program, the minimum requirements are 16 course units and 8 thesis units. Persons entering with a master's degree in business generally will need a minimum of 8 course units and 8 thesis units. The program usually is completed in four years, although students with a master's degree in business may require only three years.

International Programs. The department has worked with various language and social science faculty members to design master's and doctoral program options that address education for the growing internationalization of business. These are suited particularly for undergraduates prepared in foreign languages and cultures, international economics, and politics. M.B.A. candidates may be eligible to receive a Certificate in International Business.

Residence Requirement. Master's degree candidates must maintain continuous full-time registration through course work completion. Ph.D. candidates must maintain continuous registration through approval of a dissertation proposal, unless a leave has been approved by the Department.

Financial Aid. Financial assistance is available to a number of second-year M.B.A. students in the form of teaching assistantships in the Department of Business Administration. Opportunities for either teaching or research assistantships with other college or administrative units may be available to qualified M.B.A. students.

Most Ph.D. students receive some form of financial assistance. They may receive teaching or research assistantships (which include tuition and fee waivers), tuition and fee waivers only, and/or fellowships.

Research Interests. Faculty research interests are in the areas of marketing, organizational behavior, decision and information sciences, strategic planning and business policy, international business, accounting, economics, entrepreneurship, and finance. The College of Commerce and Business Administration houses computer facilities, a behavioral science laboratory, and a separate library, and maintains contacts with industry and government through its Executive Development Center, Executive in Residence Program, Survey Research Laboratory, Bureau of Economics and Business Research, and several professional and scholarly journals edited by its faculty.

CERAMIC ENGINEERING

(Including Ceramic Science)

Head of the Department: D.A. Payne

Correspondence and Information: Head, Department of Ceramic Engineering, University of Illinois at Urbana-Champaign, 203 Ceramics Building, 105 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.L. Berger, C.G. Bergeron, S.D. Brown, R.C. Buchanan, J.A. Nelson, D.A. Payne, W.S. Williams, J.F. Young

Associate Professors: G. Kordas, W.M. Kriven, S.I. Stupp, G.P. Wirtz

Assistant Professors: S. Granick, J. Homeny

Adjunct Professors: M. Berg, A. Kumar

Professors Emeriti: R.L. Cook, F.V. Tooley, T.A. Willmore

Graduate Degree Programs. The Department of Ceramic Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees in two areas, ceramic engineering and ceramic science. The ceramic engineering program provides instruction and research related to the applied engineering science of ceramic materials, processing, and products. Candidates in this area of graduate work are usually those who have completed an undergraduate degree in engineering. The program in ceramic science is more concerned with basic science, and candidates may come from nonengineering disciplines such as chemistry, physics, or geology.

Admission. The minimum acceptable admission average is 4.0 (A = 5.0) on the advanced undergraduate academic work of the candidate and on any previous graduate work completed. Letters of reference are also used in making the departmental recommendation on admission. For international students, the minimum acceptable TOEFL score is 575. Graduate Record Examination scores are not required.

Master of Science. The candidate for the Master of Science in Ceramic Engineering or in Ceramic Science must complete a minimum of 8 units of graduate work including a thesis. Five units of course work are required, including 3 units of ceramic engineering 400-level courses, excluding Ceramic Engineering 495, 497, and 499. Ceramic Engineering 401 and 412 are required in the three 400-level units.

Doctor of Philosophy. The minimum requirement for the Ph.D. degree is 16 units beyond the master's degree, including thesis units. Doctor of Philosophy candidates whose undergraduate degree was not earned in ceramic engineering or in ceramic science are required to complete seven ceramic engineering 300- or 400-level courses. Candidates are required to complete first the master's thesis or give evidence of equivalent research experience. They must also pass the departmental qualifying examination. There is no foreign language requirement. Minor requirements are satisfied by courses in chemistry, physics, mathematics, geology, or other engineering disciplines. Students majoring in chemistry, physics, engineering, and in certain other fields may take one or two minors in ceramic science or ceramic engineering.

Financial Aid. Candidates for graduate degrees may be supported through assistantships, fellowships, or waivers of tuition and service fees. Assistantships for research or teaching provide for a monthly stipend plus waiver of tuition and service fees. Fellowships require no work commitment and also pay a monthly stipend plus a waiver of tuition and fees. Awards for financial assistance are based principally on the candidate's academic record, statement of plans, and letters of reference.

CHEMICAL PHYSICS

Head of the Department of Chemistry: Larry R. Faulkner

Head of the Department of Physics: Ansel C. Anderson
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head of the Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head of the Department of Physics, University of Illinois at Urbana-Champaign, 211 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois 61801.

Graduate Degree Programs. A chemical physics program leading to the Doctor of Philosophy makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Fundamental research on many properties of molecular and solid state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission. Graduate College admission requirements apply. To be considered for admission, applicants should have undergraduate degrees in chemistry or physics with a strong background in the major field of chemistry or physics and more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study.

Doctor of Philosophy. In addition to taking a series of appropriate courses determined mainly by their research interests, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). In addition, students must pass an oral preliminary examination concerned with their preparation for doing research. Research for the thesis is performed under the direction of faculty who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from the Departments of Physics, Chemistry, Metallurgy, Ceramic Engineering, Electrical Engineering, and other related departments who have common interests in materials science.

Financial Aid. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School: Jiri Jonas
Associate Director of the School: John P. Hummel
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering and Chemistry. Study programs leading to the degrees of Master of Science and Doctor of Philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments and yet retain the advantages of a common approach to overlapping concerns. Service facilities, technical shops, and a placement office are provided by the

school. Support for graduate training is available in the form of assistantships, traineeships, and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department or from the director of the school.

Biochemistry

Head of the Department: Lowell P. Hager
Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 401 Roger Adams Laboratory, 1209 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.M. Clark, Jr., H.E. Conrad, R.B. Gennis, M. Glaser, R.I. Gumport, L.P. Hager, A.M. Jonas, D.J. Shapiro, S.G. Sligar, R.L. Switzer
Associate Professor: G.W. Ordal
Assistant Professors: J.A. Kaput, T.L. Karr, D.M. Kranz, M.A. Schuler, J. Widom, J.A. Wise

Graduate Degree Programs. The Department of Biochemistry offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees. For application and departmental materials which provide greater detail on programs, offerings, admission, degree requirements, and financial aid, write to the above address.

Admission. Candidates for admission to the M.S. and Ph.D. programs must have bachelor's degrees, from accredited institutions, equivalent to those from the University of Illinois at Urbana-Champaign. Courses required for admission are organic and physical chemistry, biology, a year of physics, and mathematics through calculus. Students with a weakness in any of these areas may be required to make up deficiencies during the course of their graduate study. A grade-point average of 4.0 or higher (A = 5.0) for the last 60 hours of undergraduate work in addition to any graduate study is required for admission. It is strongly recommended that students take the Graduate Record Examination (both the aptitude and advanced in chemistry or biology). Emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. Specific degree requirements for the course work and thesis M.S. degrees in Biochemistry include the successful completion of 4½ units of Biochemistry courses. A course work master's degree requires a minimum of two full-time semesters and involves 8 total units of formal lecture and laboratory course work. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. A thesis master's degree usually requires a minimum of three semester's work, and up to 3 of the 8 required units may be thesis research. Undergraduate make-up level courses in organic and physical chemistry are not normally accepted for credit toward fulfilling the degree requirements, although partial credit may be received for physical chemistry.

Doctor of Philosophy. Specific degree requirements for the Ph.D. degree in Biochemistry include the successful completion of 4½ units of Biochemistry courses. An additional 3½ units of advanced elective courses are also required for a minimum of 24 units including thesis credit. Students must also pass an oral research qualifying examination within the first eighteen months of residency, and successfully complete a series of written cumulative examinations. A thesis based on original research must be presented to a review committee at least two weeks before the final examination. The final examination is limited to a defense of the thesis research. Experience in teaching is considered a vital part of the graduate program and is required as a part of the academic work of all Ph.D. candidates in this department. There is no foreign language requirement for the Ph.D. degree in biochemistry.

Financial Aid. Financial aid for graduate students in biochemistry is available in the form of fellowships, teaching and research assistantships, tuition and partial fee waivers, and traineeships. A training grant from the National Institutes of Health supports a

multidisciplinary training program. Qualified candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally receive a tuition and partial fee waiver, as well as a stipend.

Research Interests. The Department of Biochemistry is comprised of faculty members whose research interests cover the major areas of current biochemical research.

Chemical Engineering

Head of the Department: R.C. Alkire
Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 113 Roger Adams Laboratory, 1209 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.C. Alkire, H.G. Drickamer, C.A. Eckert, T.J. Hanratty, R.I. Masel, W.G. May, A.J. McHugh, J.W. Westwater
Associate Professors: J.J.L. Higdon, M.A. Stadtherr
Assistant Professors: E.G. Seebauer, C.F. Zukoski

Graduate Degree Programs. The Department of Chemical Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees. Those interested should write to the address above for application materials and a departmental brochure which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois at Urbana-Champaign. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with deficiencies to be removed to the extent prescribed by their advisers. Graduate College admission requirements also apply.

Master of Science. Requirements for the Master of Science include 8 units of graduate credit and a thesis. At least 5 of these units must be in courses other than thesis research; 2 of the 3 required 400-level units must be in chemical engineering courses.

Doctor of Philosophy. Requirements include 24 units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test normally taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: Larry R. Faulkner
Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801.

GRADUATE FACULTY

Professors: P. Beak, R.L. Belford, T.L. Brown, R.M. Coates, D.Y. Curtin, S.E. Denmark, H.G. Drickamer, L.R. Faulkner, H. Frauenfelder, R.B. Gennis, H.S. Gutowsky, D.N. Hendrickson, J.P. Hummel, J. Jonas, J.A. Katzenellenbogen, W.G. Klemperer, P.C. Lauterbur, J.D. McDonald, E. Oldfield, I.C. Paul, W.H. Pirkle, T.B. Rauchfuss, K.L. Rinehart, K. Schulten, G.B. Schuster, D.H. Secrest, J.R. Shapley, S.G. Smith, P.G. Wolynes, P.E. Yankwich

Associate Professors: D.D. Dlott, C.E. Dykstra, J.M. Lisy, T.A. Nieman, A. Scheeline, K.S. Suslick, A. Wieckowski
Assistant Professors: P.W. Bohn, C.A. Broka, A.J. Gellman, G.S. Girolami, S.D. Kahn, P.A. Shapley, J. Widom, S.C. Zimmerman

Graduate Degree Programs. The degrees offered in chemistry are Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. Attention is also called to a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 72) and to the programs in biophysics (see page 125).

Admission: Students who have fulfilled the usual undergraduate course requirements, including at least 25 properly distributed semester hours in chemistry, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. Students who have completed graduate work in chemistry at another institution may be considered for admission if they have averages of 4.0 (A = 5.0) in both undergraduate and graduate work, or if they have earned a 4.25 average in at least 8 units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the teaching of chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree.

Master of Science in the Teaching of Chemistry. Candidates for the Master of Science in the Teaching of Chemistry must earn 4 units of credit in chemistry, 2 units in education, and 2 units of electives in either education or physical science. The 2 units in education consist of courses in educational policy studies and educational psychology (see pages 86 and 87). The courses in chemistry and the electives must be selected with the approval of the adviser. No thesis is required. Questions concerning the Teaching of Chemistry Program should be addressed to Professor D.H. Secrest, 155 Noyes Laboratory.

Master's Programs in Chemistry. Eight units of credit are required for the master's degrees. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A research thesis is optional. If a thesis is elected, 5 units of formal courses are required. If a thesis is not elected, an additional 3 units of formal courses are required. The course program in that case must include 3 units of 400-level courses, 2 of which must be in chemistry.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties, including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. A total of 24 units including thesis credit is required. The formal course requirements involve 2½ to 3½ units of 400-level courses in the major area of interest and 2 to 3 units in allied areas or fields. Besides completing formal course work, the students are required to pass a series of written cumulative examinations, pass an oral preliminary examination on research preparation, and submit a thesis on original research which is defended at a final oral examination. (Majors in organic chemistry must also demonstrate a reading knowledge of German.) Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

Financial Aid. Support for graduate students is available through fellowships and assistantships. All candidates are considered for these upon application. Graduate stu-

dents making normal progress toward their degree generally receive a tuition waiver, as well as a stipend.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering and Environmental Science in Civil Engineering)

Head of the Department: W.J. Hall

Correspondence and Information: Head, Department of Civil Engineering, University of Illinois at Urbana-Champaign, 1114 Nathan M. Newmark Civil Engineering Laboratory, 208 North Romine Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A.H.-S. Ang, E.J. Barenberg, R.L. Berger, D.E. Boyce, L.T. Boyer, E.D. Brill, E.J. Cording, M.I. Darter, B.J. Dempsey, R.S. Engelbrecht, R.A. Eubanks, W.L. Gamble, J. Ghaboussi, G.R. Gurfinkel, W.J. Hall, J.D. Haltiwanger, A.J. Hendron, P.K. Hopke, H.M. Karara, N. Khachaturian, R.W. Larimore, F.V. Lawrence, Jr., J. Lefter, J.C. Liebman, L.A. Lopez, W.H.C. Maxwell, J.W. Melin, G. Mesri, J.P. Murtha, D.A.W. Pecknold, J.T. Pfeffer, A.R. Robinson, W.C. Schnobrich, V.L. Snoeyink, M.A. Sozen, J.E. Stallmeyer, M.T. Suidan, W. Tang, M.R. Thompson, Y.K. Wen, H.G. Wenzel, K.W. Wong, B.C. Yen, J.F. Young

Associate Professors: D.P. Abrams, S.H. Carpenter, R.H. Dodds, J.W. Eheart, D.A. Foutch, R.B. Haber, E.E. Herricks, C.W. Ibbs, R.A. Larson, S.L. Paul, B.E. Rittmann, A.J. Valocchi, W.H. Walker

Assistant Professors: R.F. Benekohal, M.M. Clark, J. Garrett, K.D. Hjelmstad, A.M. Ioannides, S. Larson, J.H. Long, A. Mantoglou, I.D. Parsons, M. Rood, S.L. Wood

Graduate Degree Programs. The Department of Civil Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering, plus a joint degree, Master of Science in Architecture and Civil Engineering (construction option).

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution, aquatic ecology, computer-aided design, construction management, structural analysis and design, foundations, earthquake engineering, environmental engineering or environmental science in civil engineering, geodesy, highway materials, hydraulics and hydrology, liquid-solid waste management, materials engineering, nuclear shielding, ocean engineering, ocean structures, photogrammetry, stream and lake analysis, soil and rock mechanics, structural dynamics, structural mechanics, probability and stochastic processes, systems engineering, transportation, and water resources. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois at Urbana-Champaign, provided the applicant's preparation is appropriate to advanced study in his or her chosen major field. For additional information, see the department pamphlet "Graduate Study and Research in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering." In general, a 4.0 grade-point average (A = 5.0) for the last 60 hours of the undergraduate program and for any previous graduate work is a minimum requirement for admission to the M.S. program. Requirements for admission to the Ph.D. program are variable, but are normally substantially higher. The Graduate Record Examination is not required but is highly recommended.

Master of Science. A master's program may be completed in one full-time academic year of study. A candidate for the master's degree must complete at least 9 units without a thesis or 8 units with a thesis. In the latter case, credit is given for thesis work. Three of the units must be in courses numbered in the 400 series, and 2 of these 3 must be taken for grades in the major field. A total of at least 4 units must be in the major field.

There are no specific course requirements; individual programs are developed by the student in consultation with his or her academic adviser. At least half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign campus, or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought. Although, under certain conditions, a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time, normally such students require an additional semester. There are no foreign language requirements in the M.S. program. The joint Master of Science with Architecture degree requires a minimum of 19½ units with a thesis and 20½ units without a thesis and can be completed in five semesters of full-time studies.

Doctor of Philosophy. The degree of Doctor of Philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. A minimum of 24 units beyond the bachelor's degree or 16 units beyond the master's degree is required. In accordance with Graduate College regulations, 16 units must be completed in residence. The major area of specialization encompasses courses and research which are closely related, but the courses need not necessarily be offered by a single major department. There is no departmentwide foreign language requirement. However, the faculties of some areas of specialization may require foreign language proficiency if essential to the conduct of research in that area. The candidate must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

Financial Aid. Financial aid is available in the form of fellowships, research and teaching assistantships, and tuition and partial fee waivers.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Chairperson of the Department: D.F. Bright

Correspondence and Information: Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.J. Bateman, D.F. Bright, G.M. Browne, H.H. Hock, H. Jacobson, M. Marcovich, J.K. Newman, W.R. Schoedel, L. Zgusta

Associate Professors: J.A. Dengate, D. Sansone

Assistant Professor: J.C. Relihan

Graduate Degree Programs. The Department of the Classics offers graduate work leading to the Master of Arts in Classics, Latin, Greek, and the Teaching of Latin, and the Doctor of Philosophy in Classical Philology. Although the graduate program is designed to provide a thorough education in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including papyrology, Byzantine and Renaissance authors); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, ancient philosophy, and classical linguistics. A statement of "Regulations for Advanced Degrees in the Classics" and special programs for prospective secondary school teachers may be obtained from the department office.

Admission. In addition to meeting the admission requirements of the Graduate College, applicants for admission to graduate study in the classics curriculum must ordinarily present at least 20 hours in either Greek or Latin and 15 hours in the other language; candidates for admission to the Greek or Latin curriculum must ordinarily present at

least 20 hours in that language. Previous work in ancient history, ancient art and archaeology, philosophy, literary criticism, or linguistics is also required.

Master of Arts. The Master of Arts may be taken in classics, Greek, Latin, or the teaching of Latin. Candidates for this degree must complete 8 units of course work. For the A.M. in Classics: 6 units of Greek and Latin, with at least 2 units in each language and at least 3 units at the 400 level (excluding 400-401); 2 units of electives; and sight-translation examinations in both languages. For the A.M. in Greek (Latin): 5 units in Greek (Latin) with at least 3 units at the 400 level; 3 units of electives; and sight-translation examination in Greek (Latin). With the consent of the student's adviser, up to 2 units of thesis may be counted toward elective credit for the A.M. in Classics, Greek, or Latin. For the A.M. in the Teaching of Latin: 4 units of Latin, including 3 units at the 400-level; 2 units of education courses; and 2 units of appropriate electives.

Doctor of Philosophy. The Doctor of Philosophy is offered only in classical philology, which requires advanced work in both Greek and Latin. Candidates for the Ph.D. program are eligible for acceptance upon completion of the master's degree or its equivalent. Once admitted, they must complete at least 16 additional units. These include 8 units of course work: 6 units in Greek and Latin, with at least 2 units in each language and at least 5 at the 400 level; and 2 units of appropriate electives. The department requires a reading knowledge of two ancillary languages, German and (usually) French. Knowledge of one of these should be demonstrated at the time of admission to Level II and the other before the start of the second year at Level II. The thesis carries 8 units of credit. Admission to the thesis level requires passing the written preliminary examinations (Greek and Latin sight-translation, history of Greek and Latin literature, and a special author) and the preliminary oral examination.

Financial Aid. Teaching assistantships and University Fellowships are available for the academic year and summer session.

Research Interests. Three periodicals are edited in the department: *Illinois Classical Studies, Bulletin of the American Society of Papyrologists,* and *Journal of Coptic Studies.*

Resources. The separate Classics Library has about 45,000 titles. The University of Illinois Library's Rare Book Room houses the Turyn Archive of Greek manuscript photographs and the American Center of the International Photographic Archive of Papyri.

COMMUNICATIONS

Dean of the College of Communications: James W. Carey
Chairperson of the Graduate Committee: Howard S. Maclay
Correspondence and Information: Chairperson, Graduate Committee in Communications, University of Illinois at Urbana-Champaign, 222b Armory, 505 East Armory Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: W.F. Brewer, J.W. Carey, C. Christians, J.G. Delia, M.E. Fishbein, T. Guback, H. Maclay, R. Merritt, K.B. Rotzoll
Associate Professors: L.G. Grossberg, E.A. Wartella, D.C. Whitney
Assistant Professors: J. Nerone, P. Treichler
Professors Emeriti: J.W. Jensen, C.E. Osgood, T. Peterson

Graduate Degree Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences supported by the humanities, fine and applied arts, and natural sciences to the basic problems of human communi-

cations. It is intended for students who plan careers in teaching such communications subjects as journalism, radio-television, and psycholinguistics; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Doctor of Philosophy. The Ph.D. program requires a minimum of 24 units beyond the bachelor's degree. Students working toward a Ph.D. degree normally require from three to five years to complete their work. A full-time student entering the program directly after receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a thesis. Full-time students entering with a master's degree should expect to take a minimum of one year of course work before embarking on the thesis. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the thesis. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism or Advertising or in one of the departments in the social sciences.

COMPARATIVE LITERATURE

Acting Director of the Program: David F. Bright
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.F. Bright, W. Hollerer, F. Jost, H. Knust, J. Marchand, G. Tikku
Associate Professors: M. Palencia-Roth, J. Smarr
Assistant Professor: W.-Y. Li
Professor Emeritus: A.O. Aldridge

Graduate Degree Programs. The program in Comparative Literature offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy and is designed to provide a systematic study of subjects and problems common to several literatures. Its purpose is to enable students who have varied linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and the relations between literature and the other arts.

Admission. In addition to meeting the Graduate College admission requirements, a student entering the program should have an undergraduate major in English, the classics, or a foreign language. Majors in history and philosophy may be accepted with the special consent of the director of the program. For applicants to the Ph.D. curriculum, the A.M. will function as the qualifying test. Students entering with an A.M. degree from another university or from another department of this University will take the comparative literature component and a literary component of this program's regular Master of Arts examination at the end of the first year as a qualifying test.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or Neoclassicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for languages which may not be taught in regular departments.

The candidate must complete 8 units of credit, including a course in theory of literature (Comparative Literature 401) and three seminars in comparative literature

selected from Comparative Literature 451, 461, 471, and 481; the other 4 units should be taken in two or three national literatures in a distribution approved by the adviser; at least 5 of 8 units must be in courses at the 400-level. The candidate must pass a written examination based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text.

Doctor of Philosophy. A candidate for the Doctor of Philosophy degree must fulfill the general requirements of the Graduate College in addition to those specified above for the master's degree. Competency must be demonstrated in at least three foreign languages as well as in English. These three languages will coincide with those vital to the student's thesis and area of specialization. At least 5 units will consist of comparative literature seminars. Three additional units of work at the 400-level should be taken in courses regularly offered by the literature departments; among these, courses crosslisted with the Program in Comparative Literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student also selects a period of major interest and is responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be the Middle Ages, Renaissance, Neoclassicism, and the Enlightenment, or modern (nineteenth and twentieth centuries). Some chronological variations in coordinating the minors will be allowed for students concentrating on East/West relations. A preliminary examination, a four-part written examination based on the individual program, and an oral examination with emphasis on the thesis project must be passed. The candidate must present an acceptable thesis embracing several national literatures and pass a final oral examination on the thesis.

Financial Aid. A limited number of University Fellowships, tuition and service fee waivers, and teaching assistantships, in cooperation with other departments, is available.

COMPUTER SCIENCE

Head of the Department: C.W. Gear

Correspondence and Information: Academic Office, 240 Digital Computer Laboratory, Department of Computer Science, University of Illinois at Urbana-Champaign, 1304 West Springfield Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G.G. Belford, R.H. Campbell, M. Faiman, D.D. Gajski, C.W. Gear, W.J. Kubitz, D. Kuck, D.H. Lawrie, A. Levy, C.L. Liu, J.W.-S. Liu, G.A. Metze, R.S. Michalski, D. Muller, S. Muroga, W.J. Poppelbaum, S.R. Ray, E.M. Reingold, J.E. Robertson, A.H. Sameh, R.D. Skeel

Associate Professors: N. Dershowitz, H. Edelsbrunner, H.G. Friedman, Jr., M.T. Harandi, M.D. Mickunas, A.T. Reeves, P.E. Saylor

Assistant Professors: A.B. Baskin, G.C. Collins, P. Emrath, K.D. Forbus, A.M. Frisch, W.J. Harrod, R. Johnson, L.G. Jones, L.V. Kale, S.N. Kamin, S. Kaplan, T. Kerkhoven, D.W. Knapp, S. Kuck, K.-J. Lin, P. Ng, S. Omohundro, D. Padua, L. Pitt, U. Reddy, D. Reed, L.A. Rendell, A.V. Veidenbaum, D.C. Wilkins, M.S. Winslett, P. Yew

Graduate Degree Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science in Computer Science, Doctor of Philosophy in Computer Science, Master of Science in the Teaching of Computer Science, and a professional degree, Master of Computer Science. Areas of specialization include analysis of algorithms and theory of computation, combinatorics, computer-aided instruction, computer applications in physical and social sciences, computer networks, computer inference and machine learning, computer organization, design automation, digital computer arithmetic, digital systems design, display systems, hardware systems design, information retrieval, knowledge-based systems, microprocessor applications, numerical analysis, pattern recognition, programming languages, software systems, and switching theory.

Admission. Applicants must hold a bachelor's degree equivalent to that granted by the University of Illinois. Their grade-point average (GPA) for the last 60 semester hours (junior and senior years) of undergraduate course work must be at least 4.0 (A = 5.0). If they also hold a higher degree, their GPA for that, too, must be at least 4.0. They must submit their scores on the Graduate Record Examination (GRE) General Test. In addition, the following course background, while not mandatory, is strongly recommended: 10 semester hours of analytical geometry and calculus, 3 hours of linear algebra, 3 hours of probability and statistics, and an introductory computer science course involving programming in a block-structured language. Some promising applicants who lack a few of these requirements may be admitted on limited status, a classification that is removed once they demonstrate satisfactory progress toward their degree. In addition to these basic entrance requirements, applicants to the M.S. and Ph.D. programs should have had the equivalent of 20 semester hours in a related discipline including 12 hours in computer science. It is further strongly recommended that they submit scores for a GRE Subject Test; computer science is preferred, but another in a related field is acceptable.

A brochure giving more detailed information is available from the department's Academic Office.

Proficiency. Students admitted to the M.S., M.C.S. or Ph.D. programs must demonstrate proficiency in three (M.C.S.) or four (M.S. and Ph.D.) basic areas of computer science within their first year of graduate study. They may do so either by passing the departmental general examination offered at the beginning of each fall and spring semester or by satisfactorily completing selected courses from a list available in the departmental office. Two of the basic areas are software and computer organization. The other area or areas are chosen from: computer hardware, numerical analysis, and theory of computation.

Master of Science. The M.S. degree requires 8 units, of which at least 4 must be in computer science, and a thesis. Three or more units must be at the 400level, of which at least 2 must be in computer science and 1 must be Computer Science 499 (thesis research). Full-time students may complete their M.S. degree in one year.

Master of Computer Science. This program does not lead to the doctorate and is designed for two groups of students. The larger group comprises students who enter without an extensive computer science background but nevertheless intend to become heavily involved with computers in their professional careers. The second group is that of students with computer science degrees who are interested in the application of computers to other professional or commercial activities. The M.C.S. degree requires 5 core units in computer science, 4 units in a cognate area, and 4 units of individual study for which a report must be written.

Master of Science in the Teaching of Computer Science. The M.S.T.C.S. program is for prospective teachers of computer science at undergraduate colleges, junior colleges, vocational-technical colleges, and high schools. The M.S.T.C.S. degree requires 4 units in computer science, 2 in education, and 2 units in an area relevant to computer science education. Students are also required to complete a teaching project which may be satisfied in various ways, e.g., service as a teaching assistant, past or present employment as a high school or college teacher, practice teaching, or preparation of material for computer-aided instruction.

Doctor of Philosophy. Students admitted to the Ph.D. program must take the departmental qualifying examination by the end of their fourth semester (third semester, if admitted with an M.S. degree). This oral examination tests students' understanding of 300-level material that is relevant to their intended research areas. A student who fails may take the examination only one more time. The degree requires 16 course work units (8 units if an M.S. degree has been completed), of which at least 6 must be in computer science, 8 units in thesis research, and a thesis. The preliminary examination is orally administered by a five-person doctoral committee at the onset of the student's research, and the same committee conducts the final examination when the thesis is complete.

DANCE

Head of the Department: Patricia K. Knowles
Correspondence and Information: Graduate Program, Department of Dance, University of Illinois at Urbana-Champaign, 4-501 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, Illinois 61801.

GRADUATE FACULTY

Professors: B. Blossom, P.K. Knowles
Assistant Professors: M. Corey, R. Dicello, L. Lawrence-Powell
(The resident faculty is augmented by visiting professional artists who teach advanced studio courses. The equivalent of one full-time faculty position is reserved for the Artist-in-Residence Program.)

Admissions. Prerequisites for admission are: (1) an undergraduate degree in dance comparable to that granted by the University of Illinois at Urbana-Champaign or equivalent experience (students who are deficient in undergraduate course work may be admitted but will be expected to make up any deficiencies) and (2) demonstrated advanced technical skill and choreographic ability (candidates must pass a qualifying audition to confirm advanced technical proficiency and to demonstrate facility in choreography).

Graduate Degree Program. The M.F.A. Program in Dance is a practice-oriented terminal degree program for students in performance and choreography. Fifteen units and a minimum two-year (4 semester) residency are required for this degree. Course work taken to complete undergraduate deficiencies may increase the residency requirements to 5 or 6 semesters. A culminating creative project (Dance 498, 2 units) must be approved and accepted by the graduate faculty. Twelve units are required in the areas of technique, choreography, performance, production, independent research, theory, seminar, and the culminating project. The remaining 3 units of electives may be taken in dance or in related areas of interest. The candidate's ability to pursue graduate study will be assessed regularly, and he or she will be advised accordingly.

Financial Aid. Three forms of financial aid are offered by the Department of Dance: resident and nonresident tuition scholarships; graduate teaching assistantships which include tuition waivers; and the Creative and Performing Arts Fellowship which includes a $4,000 stipend and a tuition waiver. This Graduate College fellowship is awarded to a graduate student who demonstrates outstanding choreographic and performance talent.

ECONOMICS

Chairperson of the Department: Franklin Shupp
Director of Graduate Studies: Jan Brueckner
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: A. Anas, R. Arnould, J. Atack, W. Baer, F. Blau, J. Brueckner, M. Ferber, J. Giertz, R. Gillespie, F. Gottheil, P. Hartman, J. Heins, W. Hendricks, L. Kahn, A. Khan, R. Koenker, J. Leuthold, W. McMahon, J. Millar, L. Neal, P. Newbold, S. Rashid, R. Resek, P. Schran, F. Schupp, C. Sprenkle, K. Taira, S. Turnovsky, P. Wells, T. Yancey
Associate Professors: L. Arvan, A. Bera, D. Coes, L. DeBrock, E. Grinols, R. Husby, P. Spiller, T. Ulen, H. Williamson
Assistant Professors: B. Chakravorti, H. Esfahani, M. Feldman, T. Kim, C. Kolstad, P. Sen, M. Spagat

Graduate Degree Programs. The Department of Economics offers graduate work leading to the Master of Science in Policy Economics and Doctor of Philosophy degrees.

The candidate for an advanced degree may specialize in the following fields: economic theory, environment and natural resources, history of economic thought, public finance, monetary theory, international economics, economic history, labor economics, growth and development, comparative economic systems, urban and regional economics, mathematical economics, econometrics, industrial organization, transportation, and human resource economics.

Master of Science in Policy Economics. This is a specially designed, intensive one-year program of study. It is intended for promising, young administrators in government and private institutions in both Third World countries and advanced, industrial countries who need additional training in the areas of economic analysis and quantitative techniques. Individuals with other backgrounds and interests may substitute appropriate advanced-level courses for the core courses listed below.

The program of study in Policy Economics consists of 10 units of graduate course work. A core of four courses—Macroeconomics, Microeconomics, Statistics, and Applied Econometrics—is required of all students in the program. Beyond that core, students select one field of concentration from those listed above. An additional four graduate credit courses are to be completed. Two of these must be taken in economics and an additional two courses may be in economics or in other areas outside of economics. Students may enter the program in the summer term or in the fall term.

This required course work is further enriched through (1) a short course in computers which is later used in the statistics and econometrics courses; (2) opportunity to go on field trips to observe financial institutions, commodity exchanges, and the like; (3) scheduled lectures by outstanding internationally known economists; (4) discussion groups and tutoring for participants who are having difficulty; (5) program staff to help with visas, housing, and other problems.

Tuition and fees for this program are substantially higher than regular tuition and fees. No financial aid is available for students in this program.

Doctor of Philosophy. The Ph.D. program requires the completion of 24 units of study beyond the bachelor's degree. Specific requirements include 1 unit in economic history, 1 unit in history of economic thought, 2 units in statistics and econometrics (some or all can be met by demonstration of proficiency), and 8 doctoral thesis units. The candidate is also required to pass written preliminary examinations in economic theory and in three specialized fields, including at least two in economics (course work with appropriate grades may be substituted for one of the three field exams). The normal preparation for these preliminary examinations is 4 units of study in economics theory and 2 units of study in each of the specialized fields. In addition, the candidate is required to give an oral defense of the thesis proposal and pass an oral final examination covering the research. Students with an appropriate background in economics and mathematics who devote full time to graduate work can complete the Ph.D. degree in three years beyond the bachelor's degree. An additional year or more is usually necessary, however, for those holding part-time assistantships.

In addition to the standard undergraduate preparation in economics, the student is expected to have had at least two semesters of calculus and one of linear algebra to be admitted to the Ph.D. program. The results of the Graduate Record Examination should accompany applications for admission. The Graduate College admission requirements apply. In addition, foreign students must submit TOEFL results.

Master's Program in Economics. A master of arts degree and a master of science degree are available for students in the Ph.D. program to enable them to earn a master's as they work toward the Ph.D. degree. Students interested in a terminal master's degree are not admitted to the Ph.D. program.

Financial Aid. Over the past seven years, the Department of Economics has been able to offer fellowships or half-time assistantships to all domestic students who meet the standards for entrance or continuation in the Ph.D. program. A similar commitment to domestic students is anticipated for the coming year. Teaching assistantships are generally not given to foreign students during their first year due to language difficulties.

EDUCATION

(Including Administration, Higher, and Continuing Education; Educational Policy Studies; Educational Psychology; Elementary and Early Childhood Education; Secondary Education; Special Education; and Vocational and Technical Education)

Dean of the College of Education: Nancy S. Cole

Correspondence and Information: Fred S. Coombs, Associate Dean for Graduate Programs, College of Education, University of Illinois at Urbana-Champaign, 120 Education Building, 1310 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R.E. Ames, J.D. Anderson, R.C. Anderson, S.R. Asher, L.A. Braskamp, P.G. Braunfeld, A. Brown, J.R. Burnett, J.C. Campione, N.S. Cole, R.J. Colwell, R.B. Davis, D. Durkin, J. Easley, R.H. Ennis, E.L. Evertts, H.S. Farmer, W. Feinberg, L.R. Goulet, M.B. Griggs, L.W. Harmon, L.W. Heal, R.A. Henderson, J. Hill, K.T. Hill, S.O. Ikenberry, W.D. Johnson, L.J. Jordan, B.B. Kachru, C.J. Karier, L.G. Katz, H. Kazanas, C. Leonhard, R.L. Linn, J.W. Loeb, H.S. Maclay, M.L. Maehr, T. Manolakes, J.A. Mason, G. McConkie, W.W. McMahon, A. Ortony, P.D. Pearson, A. Peshkin, L.A. Phelps, F.A. Rodgers, B.V. Rosenshine, L.J. Rubin, F. Rusch, S.J. Savignon, M. Saville-Troike, P. Shoresman, R.A. Smith, H.T. Spitze, B. Spodek, R.L. Sprague, R.E. Stake, B.E. Swanson, M.M. Tatsuoka, K.J. Travers, R. Troike, P.C. Violas, J.L. Walker, T.L. Wentling, C.K. West, I. Westbury, B.A. Yates, J.S. Zaccaria

Associate Professors: C.A. Ames, E.F. Anderson, T.H. Anderson, B. Armbruster, R.M. Becher, C. Blankenship, L.F. Bouton, F.S. Coombs, C.A. Cziko, J.R. Dennis, D.L. Essex-Sorlie, J. Farmer, L.F. Fitzgerald, J.A. Fley, J.W. Halle, D.L. Harnisch, H.R. Kaczkowski, K.R. Koenke, J. Leach, M.V. Levine, A.L. Madsen, E.F. McClure, J.A. McCollum, T.L. McGreal, J.F. Murphy, R.E. Nelson, G.B. North, J.C. Ory, A.M. Renzaglia, S. Rosenholtz, J.B. Rounds, E.B. Russell, D. Scott-Jones, M. Shorish, R.J. Spiro, K. Tatsuoka, E.R. Terwilliger, P.W. Thurston, J.L. Wardrop, C.M. Weller, K.G. Witz

Assistant Professors: D.C. Brandenburg, J. Chadsey-Rusch, E.J. Copeland, K.A. Copeland, J.L. Ellickson, C.E. Kozoll, S.R. Levy, L.A. Meyer, E.W. Osborne, R.C. Page, P.S. Riegel, M.A. Siegel, E.R. Steinberg, S.E. Tozer, T.J. Tracey, W.T. Trent, J.G. Ward, M.L. Waugh, R.F. Wilson

Professors Emeriti: C. Allen, H.S. Broudy, C.B. Cox, T. Denny, R.N. Evans, O. Gould, J.T. Hastings, P.E. Hemp, D. Henry, G.A. Hoke, L.G. Humphreys, J.M. Hunt, M.B. Karnes, H.H. Lerch, C.J. McIntyre, W. McLure, F. McMurray, L. Metcalf, W.J. Moore, C.H. Patterson, M.J. Phillips, L.J. Phipps, P. Quigley, F.M. Raubinger, H. Shores, R.H. Simpson, J.M. Slater, R. Tomlinson, L.R. Tucker

Graduate Degree Programs. The College of Education offers graduate work leading to the Master of Education, the Master of Arts, the Master of Science, the Advanced Certificate, the Doctor of Education, and the Doctor of Philosophy degrees.

Graduate students in the College of Education may enroll in one of the seven departments within the college listed above. The following suggests the broad range of specialties available within the college: agricultural education; aesthetic education; bilingual multicultural education; business, office, and distributive education; comparative education; continuing and adult education; computer applications in education; counseling psychology; early childhood education; educational administration and supervision; educational psychology; elementary school subject specialties (mathematics, language arts, science, social sciences); statistics and measurement; health occupations education; higher education; history of education; educational policy analysis; home economics education; human development; industrial education; language development; learning and instruction; philosophy of education; quantitative and evaluative research methodologies; reading; secondary education (English, mathematics, science, social science); sociocultural perspectives; special education; (a) special learning and behavior problems, severe behavioral handicaps, early childhood education, vocational education for students with special needs, skills improvement, and (b) program admin-

istration; and teacher education (elementary, secondary, vocational, special). Other areas of specialization within education may be developed by the student and adviser. More detailed descriptions of specializations offered within departments are available through departmental offices.

Certification. State certification as a teacher or administrator is required for advanced graduate study in some fields. The Council on Teacher Education functions as the all-University governance system for certification. Graduate students who wish to qualify for the council's recommendation for a teaching certificate must complete the appropriate undergraduate or graduate program or its equivalent. Individual exceptions must be sought via petition to the council. Students are invited to contact the coordinator of the Council on Teacher Education to ascertain the approval status of each program with the Illinois State Board of Education.

Master of Education.

Admission. Students may be considered for admission if they are: (1) graduates of an institution awarding a baccalaureate or equivalent degree comparable to that of the University of Illinois at Urbana-Champaign; (2) adequately prepared for advanced study as demonstrated by previous experience, personal qualifications, and scholastic records; and (3) recommended by the proposed department of study. The Graduate College admission requirements apply. Some departments in the College of Education require additional test scores of applicants.

Program Description. Within each of the departments in the College of Education exists a rich variety of practice-centered programs adaptable to the interests of beginning graduate students. The Master of Education is a professional degree designed for those students who seek a practical understanding for work in the educational professions.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration where there is a 10-unit requirement. Students are required to take two courses in Educational Psychology and two courses in Educational Policy Studies. In Educational Psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In Educational Policy Studies, one ½-unit course is selected from the social foundations area (Educational Policy Studies (300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, and 307). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required, and the program is completed by additional 300- or 400-level courses selected by the student in consultation with the academic adviser. Individual departments in the college may require a student to take additional courses beyond these to complete the program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No thesis is required for the Ed.M. degree.

Master of Arts and Master of Science. Admission requirements are the same as those for the Master of Education degree.

Program Description. An extensive offering of research-based programs may be found in the college. All the specialties listed earlier may be pursued from a research perspective. The A.M. and M.S. are research-oriented degrees designed for students who seek research careers in education-related fields.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration and counseling psychology where there is a 10-unit requirement. Students are required to take two courses in Educational Psychology and two courses in Educational Policy Studies. In Educational Psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of

personality and development area (Educational Psychology 312, 315, or 316). In Educational Policy Studies, one course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, and 307). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required. Individual departments may require a student to take additional courses to complete a program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No more than 2 units of thesis credit count toward the minimum 8 units. Each student must defend the required thesis in an oral examination before a committee of three faculty members chaired by the student's adviser.

Advanced Certificate in Education.

Admission. A master's degree in an appropriate field and two years of successful professional education experience are required for admission to the advanced certificate program. Some advanced certificate programs require students to submit Miller Analogies Test scores for admission.

Program Description. The advanced certificate may be pursued in administration, higher, and continuing education; educational psychology; elementary and early childhood education; secondary education; special education; and vocational and technical education. The advanced certificate program is intended for students who desire a planned course of study beyond the master's degree, but do not wish to pursue the type of scholarly work typically expected in a doctoral program.

Requirements. A minimum of 8 units beyond the master's degree is required for the degree. Four units must be at the 400-level. A student who has not previously taken the foundation courses in Educational Psychology and Educational Policy Studies required for the Ed.M., A.M., or M.S. degree must do so or pass proficiency examinations for these courses. The credit–no credit option may not be used to satisfy the minimum requirements for this degree.

Doctor of Education.

Admission. Applicants for study leading to doctoral degrees must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Departments should be contacted concerning their requirements for submission of test scores and other information. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The general admission requirements of the Graduate College must be met.

Program Description. Students may study any of the broad range of specialties listed on page 85. Programs leading to the Doctor of Education degree are designed to provide advanced professional training and to develop further ability in the scholarly study of professional practice-centered problems.

Requirements. Sixteen units of course work beyond the master's degree are required. A student who has completed course work taken as part of the requirements for the Advanced Certificate in Education at the University of Illinois at Urbana-Champaign may petition for the application of not more than 6 units of such work toward the program leading to the Doctor of Education, provided that the course work has been taken within five years of the date of petition. Within the required 16 units, students must complete two perspective course options of 2 units each, designed to help them understand and interpret their developing practitioner-scholar role. Options are chosen from an approved list of courses in several areas. Between admission and completion of degree requirements, an Ed.D. student must complete a supervised field work experience for which from 1 to 4 units of credit may be awarded.

Minimum residence requirements may be met by on-campus registration for either two consecutive semesters with at least 3 units of course work in each, or one semester with at least 3 units, plus at least 1½ units in the summer session immediately preceding or following.

Near the end of course work and before admission to the preliminary oral, the applicant must take a minimum of ten hours of written examinations, eight in the special field of study, and two in research methodology. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by three readers. All parts of the examination must display competent doctoral work to all readers.

In addition to the 16-units of course work, an Ed.D. candidate must complete a thesis in accordance with the general requirements of the Graduate College.

Doctor of Philosophy.

Admission. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The Graduate College admissions requirements apply. Applicants must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Departments should be contacted concerning their requirements for submission of test scores and other information.

Program Description. Students may study any of the specialties listed on page 85. The Ph.D. program is planned by each student with an adviser to develop the student's ability to do scholarly research in a specialized field of education.

Requirements. Sixteen units of credit beyond the master's degree, including up to 8 units of thesis credit, are required for the Ph.D. degree. A candidate who has not written a master's thesis is required to prepare, submit, and defend an equivalent paper. Each Ph.D. candidate in the College of Education completes, as a part of the graduate program, an approved supervised professional work experience that consists of at least the equivalent of half-time work for one semester. This requirement is to be completed during the period between admission and completion of degree requirements. Acceptance of credit earned elsewhere does not reduce the Graduate College resident credit requirement. The College of Education requires a residence period, beyond the master's which must include two successive semesters on the Urbana-Champaign campus, in each of which the student takes a minimum of 3 units.

A student is required to demonstrate competence in one of several research methodology areas. This requirement is in addition to the minimum of 16 units of credit beyond the master's degree. Research methodology area requirements are available from the Graduate Programs Office, College of Education.

A Ph.D. candidate must complete a minimum of eight hours of written examinations in an area of specialization. Examinations are taken in two parts of four hours each. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by at least three readers. All parts of the examination must display competent doctoral work to all readers.

A Ph.D. candidate must complete a thesis in accordance with the general requirements of the Graduate College.

Financial Aid. All major doctoral programs have teaching and research assistantships available. Some fellowships and tuition and service fee waivers are also available. In the past it has been possible for a majority of doctoral students to receive some form of financial aid during their period of study. Additional information concerning financial aid can be obtained from the seven departmental offices listed on page 85.

ELECTRICAL AND COMPUTER ENGINEERING

Head of the Department: T.N. Trick

Correspondence and Information: Graduate Programs, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 155 Electrical Engineering Building, 1406 West Green Street, Urbana, Illinois 61801.

GRADUATE FACULTY

Professors: J.A. Abraham, R. Adler, R.B. Ash, M.T. Basar, D.L. Bitzer, S.A. Bowhill, R.M. Brown, C.A. Cain, J.C. Chato, A. Cho, J.J. Coleman, P.D. Coleman, J.M. Crowley, E.S. Davidson, T.A. DeTemple, F. Dunn, J.G. Eden, E.W. Ernst, M. Faiman, O.L. Gaddy, C.S. Gardner, B.E. Hajek, I.N. Hajj, P. Handler, D.F. Hang, M.S. Helm, K. Hess, N. Holonyak, Jr., T.S. Huang, B.J. Hunsinger, W.K. Jenkins, K. Kim, P. Kokotovic, Wm. J. Kubitz, P.R. Kumar, B.C. Kuo, S.W. Lee, C.H. Liu, Y.T. Lo, P.E. Mast, P.E. Mayes, G.A. Metze, G.H. Miley, R. Mittra, D.E. Muller, S. Muroga, M.A. Pai, J.H. Patel, W.R. Perkins, D. Pines, H.V. Poor, W.J. Poppelbaum, F. Preparata,, M.B. Pursley, P. Ransom, N. Rao, S.R. Ray, J.E. Robertson, C.T. Sah, D.V. Sarwate, C.F. Sechrist, Jr., L.G. Smith, G.E. Stillman, G.W. Swenson, Jr., T.N. Trick, R.J. Turnbull, M.E. Van Valkenburg, J.T. Verdeyen, D.L. Waltz, K.C. Yeh

Associate Professors. A. Ahuja, J.W. Beauchamp, D.J. Brown, W.C. Chew, G. Dejong, L.A. Frizzell, M. Ilic, R. Iyer, S. Kang, P.W. Klock, J.P. Leburton, H. Lee, M.C. Loui, R.L. Magin, E.A. Mechtly, H. Merkelo, L.D. Metz, H. Morkoc, D.C. Munson, Jr., B. Oakley, W.D. O'Brien, Jr., P.W. Sauer, P.D. Schomer, B.W. Wah

Assistant Professors. K.S. Arun, P. Bannerjee, S.L. Chuang, S.J. Franke, W.K. Fuchs, J.W. Grizzle, J. Kolodzey, E. Kudeki, M.J. Kushner, J.W. Lyding, K.R. Poolla, V. Ramachandran, V.B. Rao, P.E. Stepp III, L. Weber, B.C. Wheeler

Graduate Degree Programs. Graduate study in electrical and computer engineering leading to the degrees of Master of Science and Doctor of Philosophy is offered in four general areas: circuits and systems, which include integrated circuits, computer-aided design, signal and image processing, control systems, and optimization; computers and information systems, which include computers, switching theory, information theory, communication theory, information retrieval, computer vision, robotics and artificial intelligence; electromagnetic fields, which include antennas, propagation, aeronomy, radio location, and holography; and physical and quantum electronics, which include solid state theory and devices, compound semiconductor epitaxial growth techniques, microwave and high-speed devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, biomedical instrumentation, ultrasonics, and electronic music.

Admission. Admission is competitive. Only those with excellent GPAs who have completed an electrical engineering curriculum substantially equivalent to that of the University of Illinois at Urbana-Champaign are admitted. Excellent scores from the General Test of the Graduate Records exam are required. Graduates of curricula in the physical sciences and mathematics may also be admitted to advanced study if they have the necessary background to profit from graduate work in electrical engineering.

Master of Science. A minimum of 8 units, including a maximum of 2 units of thesis research, must be completed for the master's degree. At least 4 units must be 400-level courses in electrical and computer engineering (up to 2 thesis units may be counted), including one from a list of specific courses in each of two of the four basic areas. Courses which are required in the undergraduate curriculum at the University of Illinois at Urbana-Champaign cannot be applied to the credit requirements for an advanced degree. No final examination is required for the M.S. degree.

Doctor of Philosophy. All students desiring to enter the doctoral program must take the electrical and computer engineering qualifying examination during the term they earn their seventh unit of graduate credit, excluding Electrical Engineering 499 (Thesis Research) and Electrical Engineering 490 (Seminar in Special Topics). Students who enter with the master's degree take the examination during the first term here. Admission to the doctoral program is based upon the quality of the course work, the qualifying

examination, and an assessment of the ability of the candidate to do independent research.

Eight units of course credit beyond the master's degree or the equivalent, successful completion of the preliminary examination, 8 units of thesis research, a satisfactory thesis, and satisfactory defense of the thesis in a final examination are minimum requirements for the degree of Doctor of Philosophy. No foreign language proficiency is required.

Extramural Study. The department offers extramural graduate courses administered by the Office of Continuing Education and Public Service leading to the Certificate in Engineering granted by the office. Requirements for the M.S. degree can be fulfilled by one semester of residence after completing the requirements of the certificate program. For information about this certificate program, write to the Office of Continuing Education and Public Service, University of Illinois at Urbana-Champaign, Suite 1406, 302 E. John Street, Champaign, Illinois 61820.

Under special circumstances, it may be possible to complete the M.S. degree off campus by taking extramural graduate courses that are designated for residence credit, including the M.S. thesis requirement. Such cases are considered on an individual basis upon petition to the departmental graduate committee.

ENGLISH

Head of the Department: Richard Wheeler
Director of Graduate Studies: James Hurt
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 210 English Building, 608 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D. Baron, N. Baym, E. Brandabur, R. Carringer, H. Cole, D. Curley, J. Frayne, J. Friedman, P. Garrett, G. Hendrick, J. Hurt, D. Kramer, L. Lieberman, C. Nelson, C. Sanders, R. Shuman, J. Stillinger, E. Watts, R. Wheeler
Associate Professors: G. Adelman, L. Danielson, J. Dundas, J. Dussinger, C. Fontenot, P. Friedman, A. Guibbory, J. Hinely, F. Hodgins, A. Kaufman, M. Kaufmann, D. Kay, J. Klein, C. Kyle, D. Majdiak, H. Marder, B. Michelson, M. Mullin, M. Shapiro, B. Smalley, J. Stubbs, Z. Sullivan, L. Waldoff
Assistant Professors: L. Chai, A. Deck, M. Loeffelholz, S. Muir, R. Parker, J. Stottlar, R. Sullivan, C. Wright

Graduate Degree Programs. The department of English offers programs of study leading to the Master of Arts, the Master of Arts in the Teaching of English, and the Doctor of Philosophy degrees. The Ph.D. program is, in general, designed to educate and train teacher-scholars who will take positions in colleges and universities throughout the country. The Master of Arts programs may be either a first step toward the Ph.D. degree or a final educational stage for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. There is no graduate creative writing program.

Admission. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least 20 semester hours of undergraduate college work in English and American Literature excluding required college work in rhetoric or composition. Applicants are required to submit Graduate Record Examination scores for the verbal and advanced tests. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been significantly higher than the 4.0 (A = 5.0) required by the Graduate College. The committee on admissions tends to select those applicants who have a solid array of undergraduate courses, knowledge of a foreign language, and real promise of earning degrees within a reasonable time. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Arts. A candidate for the A.M. in English must spend at least two semesters or the equivalent in residence and complete at least 8 units of course work. At least 4 units must be at the 400-level, and 3 of the 4 must be in English. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work. The student must pass, on formal examination, the master's comprehensive examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's degree must apply formally and is considered in competition with applicants who are taking the master's degree elsewhere. Seldom are applicants accepted with graduate averages below 4.5. Students who have taken their Master of Arts degrees elsewhere must pass the master's comprehensive examination during their first year of residence and give evidence of knowledge of one foreign language on a level equivalent to that required of A.M. candidates in our program. (The master's comprehensive examination can be waived by the director of graduate studies if the candidate submits appropriate evidence that a similar examination formed part of his or her master's degree.) The student takes 8 units of course work, planned in consultation with an adviser. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There is one formal examination, the special field examination, which is normally taken as the student completes course work and prepares to write the thesis. The student then goes on to write a thesis under the direction of a committee composed of three professors. A total of 16 units beyond the master's degree, including thesis credits, are required. A full-time student can complete this program in three years beyond the master's degree.

Financial Aid. Financial aid is available to students in the form of fellowships, teaching assistantships, and waivers of tuition and service fees. Applicants are considered at only one time of the year, and the deadline for submitting applications is February 15. For complete information about the program, prospective applicants should write to the above address for the department's handbook on graduate studies in English.

ENGLISH AS AN INTERNATIONAL LANGUAGE

Director of the Division: Braj B. Kachru

Correspondence and Information: Director, Division of English as an International Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.C. Cheng, B. Kachru, Y. Kachru, C.-W. Kim, H. Maclay, S. Savignon, M. Saville-Troike, R. Troike, L. Zgusta

Associate Professors: L. Bachman, E. Bokamba, L. Bouton, J.R. Cowan, G. Cziko, W. Dickerson, H. Hock

Assistant Professors: N. Besnier, S. Gonzo, M. Mack

Professor Emeritus: K. Aston

Graduate Degree Program. The Division of English as an International Language offers a Master of Arts in the Teaching of English as a Second Language (M.A.T.E.S.L.).

Admission. In addition to meeting the Graduate College admission requirements, applicants should present evidence of appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher-training curriculum in one of the above or in elementary education. Native speakers of English must have studied at least one foreign language for four semesters or the equivalent or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English by attaining a score of at least 570 on the TOEFL examination. The TOEFL examination is required of all

applicants to the M.A.T.E.S.L. curriculum who are not native speakers of English, even when the requirement for that examination has been waived by the University itself.

Master of Arts in the Teaching of English as a Second Language. The program leading to this degree requires a minimum of 10 units, 2 of which must be taken from 400-level courses. Candidates must either pass a written comprehensive examination or complete a thesis. Normally, the M.A.T.E.S.L. degree can be completed in four semesters. The curriculum is interdisciplinary and involves work in such areas as descriptive linguistics, language acquisition, the interrelationships of language and culture, language pedagogy, language testing, teaching English as an international language and bilingual education, and language study. Through the scope and diversity of its courses, the master's program prepares students for both overseas and domestic opportunities.

The Doctor of Philosophy degree, an option in applied linguistics and the teaching of English as an international language, is available through the Department of Linguistics and the interdisciplinary program in Second Language Acquisition and Teacher Education (SLATE). Members of the graduate faculty of the Division of English as an International Language are available to serve on doctoral committees. Faculty specializations include neurolinguistics, sociolinguistics, psycholinguistics, language testing, contrastive discourse, lexicography of English, stylistics, language processing, reading, literacy, pragmatics, computers in second language acquisition and learning, methodology of language teaching, and English in the world context. Applicants interested in working toward a doctorate in linguistics should write to the Chairman, Department of Linguistics, 4088 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801. Those interested in SLATE should write to the Chair, SLATE Program, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801.

Financial Aid. Financial assistance is not normally awarded during a M.A.T.E.S.L. candidate's first semester. Exceptions to this policy are sometimes made when an applicant has had extensive experience in teaching English as a second language or has an outstanding academic record. A limited number of University fellowships are available for exceptionally qualified candidates. Teaching assistantships are normally available to qualified students in the division and in the Intensive English Program which is a constituent unit of the division.

ENVIRONMENTAL STUDIES

Director of the Institute: Roger A. Minear
Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 408 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E.D. Brill, Jr., R.J. Burdge, D.M. Gardner, L.G. Hansen, P.K. Hopke, L.D. Hopkins, R.A. Minear, M.J. Plewa, G.L. Rolfe, W.D. Seitz
Associate Professor: R.A. Larson
Assistant Professors: J.M. Alho, E.H. Jeffery, C.D. Kolstad, K.N. Paige, D.G. Simpson, J. Vining
Professors Emeriti: B.B. Ewing, R.L. Metcalf

The Institute for Environmental Studies coordinates and supports programs of research, teaching, and public service in areas related to environmental quality. Although the institute does not offer degree programs, it offers graduate-level courses on environmental subjects and provides opportunities for students working within specific disciplines to participate in interdisciplinary environmental research.

The institute's close ties with many other campus units make it possible for students seeking graduate degrees from those units to engage in environmental research within the institute's varied interdisciplinary program. Current scholarly research at the insti-

tute addresses a wide range of significant environmental program areas, including environmental toxicology, environmental mutagens and carcinogens, water quality and water resources management, air pollution and source contribution resolution, effects of pollution on biological systems, environmental chemistry, social and economic impacts of resource development, risk assessments, analysis of environmental decision making and alternative pollution control methods, and environmental quality management. This research program involves faculty with backgrounds in such diverse fields as genetics, chemistry, physics, pharmacology, teratology, ecology, engineering, economics, leisure studies, sociology, and law.

The interdisciplinary environmental toxicology program, coordinated by the institute, offers specialized training in the study of toxic substances in the environment. This program has recently been expanded to provide a concentration in the health effects of environmental toxicology. Graduate students with backgrounds in fields such as the life sciences, health sciences, chemistry, or engineering, are eligible to apply for admission to the program. Faculty from several University schools and colleges participate in the program's teaching and research activities and serve as research advisers to its students. In addition to completing a core of course work in environmental toxicology, degree candidates must satisfy the requirements of the cooperating graduate unit in which they are enrolled. Financial support is available through a limited number of graduate research assistantships for which students may apply through the institute. A brochure describing the program and the requirements for admission and graduation is available from the institute.

The institute's interdisciplinary program in environmental mutagens and carcinogens complements the graduate degree specialization in environmental toxicology described above. The objectives of this program are to develop methods to detect and identify mutagenic substances; determine their sources, transport, transformations, and fate in the environment; evaluate exposures to target organisms; and evaluate the economic and social impacts of these exposures.

Further information on opportunities for graduate education in environmental studies at the University of Illinois at Urbana-Champaign is provided in *Environmental Graduate Programs*, a brochure available from the institute. Also available is a comprehensive listing of environmentally oriented courses currently offered by the institute and by other campus units.

EXTENSION EDUCATION

Head and Graduate Adviser: Violet M. Malone
Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 330 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

Graduate Degree Program. The Master of Extension Education degree program is a professional program providing advanced study in agriculture and in human resources and family studies, including further study in the social sciences.

Admission. Applicants are expected to possess a bachelor's degree in agriculture, home economics, or a closely related field, and to meet the Graduate College admission requirements.

Degree Requirements. The program consists of a minimum of 8 units with a thesis or 9 units without a thesis. Three units must be in 400-level courses, with 2 of these in the major field. A major, consisting of 4 units, may be taken in agriculture, human resources and family studies, or the social sciences. Students majoring in agriculture or human resources and family studies select 4 additional units from the social sciences; those majoring in the social sciences select 4 additional units from agriculture or human resources and family studies. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. At least 4 units must be earned in residence on the Urbana-Champaign campus.

FINANCE

Chairperson of the Department: William R. Bryan
Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce Building (West), 1206 South Sixth Street, Champaign, Illinois 61820-6271

GRADUATE FACULTY

Professors. W.R. Bryan, I.O. Bull, T.E. Cammack, P.F. Colwell, J.E. Finnerty, J.A. Follain, J.A. Gentry, J. Lakonishok, C.F. Lee, C.M. Linke
Associate Professors: R.E. Cannaday, M.J. Lynge, Jr., H.Y. Park, D.T. Whitford
Assistant Professors: K.C. Chen, S.P. D'Arcy, Y. Dokko, L.O. Scott

Graduate Degree Programs. The Department of Finance offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The following fields are available for specialization: financial institutions, corporation finance, investment, insurance, and urban economics and real estate.

Admission. The minimum required admission grade-point average is 4.0 (A = 5.0). To be admitted without deficiencies, the applicant should have completed an undergraduate course in computer science, financial accounting, managerial accounting, principles of economics, calculus (two semesters), probability and statistics (two semesters), and two courses in financial management. Courses to remove deficiencies may be taken after beginning the program, but such courses will not count toward the departmental requirements for graduation. Candidates are required to submit aptitude test scores from the Graduate Management Admission Test. The score will be used by the Graduate Standards Committee, along with other information, in evaluating the applicant's qualifications for graduate study.

Master of Science. A candidate for the master's degree in finance must spend at least two semesters in residence. The credit requirement for this degree is 8 to 10 units. Two units of economic theory are normally required. However, students with sufficient economic theory course work may have this requirement replaced by other economics course work, additional finance course work, or additional elective course work, as determined by the Graduate Standards Committee. The department has an optional thesis policy for the master's degree. The credit requirement for this option is 8 units. Three of the 8 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work. The credit requirement for the nonthesis option is 10 units. Three of these 10 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work.

Master of Science in Finance and Master of Architecture. The Department of Finance and School of Architecture offer a joint masters program. Individual requirements are the same initially for each individual program. Program prerequisites are a baccalaureate degree in architecture, including Computer Science 102 and Mathematics 120 to 131; background courses in finance met by graduate course requirements; 2 units of economic theory; 3 units of quantitative methods; 4 units in finance; 4¾ units of architectural options courses; 3 units of the financial management sequence in business management; and other elective requirements. The joint masters program is granted when these requirements, totalling 21¾ units, are completed.

Doctor of Philosophy. The first stage toward the degree of Doctor of Philosophy ends when the candidate receives a master's degree or earns the equivalent credit; the second stage comprises 8 units of work, fulfillment of departmental requirements, and successful preliminary examinations; the third stage includes research and seminars (8 units), preparation of the dissertation, and the final examination. A student's courses and research are planned with his or her adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the department. The student should become familiar with these requirements and satisfy them as soon as possible.

A candidate for the doctorate who has received a master's degree from a recognized institution receives the equivalent of 8 units of credit for that work. If such credit is to be used in partial fulfillment of the requirements for the doctorate, the candidate is examined on the content of the courses involved at the time of the preliminary examinations.

To enter the third stage of a doctoral program, a candidate must pass preliminary examinations to test his or her qualifications for further advanced study and research. The examinations are written and oral. Candidates are responsible for four fields for preliminary examination: economic theory, two finance areas, and one elective area.

The Doctor of Philosophy is primarily a research degree, and the candidate must demonstrate the capacity for independent research by producing an original thesis on a topic within his or her major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The candidate is admitted to the final examination by the dean of the Graduate College upon completion of the dissertation and the recommendation of the department.

FOOD SCIENCE

Head of the Department: Arthur J. Siedler

Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 567 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. Bechtel, M. Cheryan, J.W. Erdman, P.V. Johnston, J. Milner, R. Nelson, T. Nishida, E.G. Perkins, A.J. Siedler, M.P. Steinberg, W.J. Visek, L.S. Wei, L.D. Witter

Associate Professors: C. Argoudelis, I. Baianu, H.P. Blaschek, B.H. Cho, S.E. Martin, R. Villota

Assistant Professors: W. Artz, J. McCord, R. Speckman

Graduate Degree Programs. The Department of Food Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: processing-engineering, chemistry, microbiology, and nutrition

Admission. In addition to meeting the Graduate College admission requirements, a student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies may be removed with graduate credit courses designed for this purpose.

Master of Science. To obtain a master's degree, a student must have 2¾ units in food science. The remainder of the 8 units of credit required consists of graduate courses selected from inside or outside the department that are appropriate for the training and development of the student in the field of specialization. At least 3 units must be at the 400-level (¼ unit of this is seminar). A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required. Students whose native language is not English are required to have competence in English by passing English as a Second Language 111.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the Doctor of Philosophy degree must have additional credit in seminar (¼ unit) and thesis research (8 units). The remainder of the 16 units required for the degree consists of graduate courses selected from inside or outside the department that are appropriate for training in the student's field of specialization. The student must demonstrate proficiency in one foreign language or complete a special option approved

by the department, which is not counted as part of the 16 required units of credit. Students whose native language is not English must pass English as a Second Language 401. Upon completion of all necessary formal courses and special options, the student is required to take an oral preliminary examination. After passage of the preliminary examination, the student's activities are primarily devoted to thesis research. Upon submission of the thesis, the candidate is admitted to the final oral examination before a graduate faculty committee. The Ph.D. degree in food science may be combined with the study of medicine in the University of Illinois at Urbana-Champaign Medical Scholars Program.

FORESTRY

Head of the Department: G.L. Rolfe
Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 110 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. Chow, G.L. Rolfe
Associate Professors: S. Brown, J.M. Cheeseman, J.O. Dawson, G.Z. Gertner, R.M. Skirvin
Assistant Professors: G.E. Campbell, M.B. David, D.E. Harry, L.R. Iverson, G.A. Mendoza, A.D. Pugel

Graduate Degree Program. The department of Forestry offers graduate work leading to the Master of Science degree. The Doctor of Philosophy degree is not offered by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department or is on the staff of an interdisciplinary doctoral program. Such areas of study include ecology, economics, genetics, plant physiology, soils, and wood science.

Admission. The prerequisite for graduate study in the Department of Forestry is a bachelor's degree in forestry or a related field. A grade-point average of 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Those applicants who do not meet the minimum requirements are encouraged to take the Graduate Record Examination, as exceptions to these prerequisites are possible on an individual basis. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. To qualify for the Master of Science degree, a student must earn at least 8 units of graduate credit, with at least 3 units in courses at the 400-level. At least half of the 8 units must be from courses meeting on the Urbana-Champaign campus or from courses approved by the Graduate College for residence credit, although meeting at other locations. Depending on their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student in such areas as biometrics, ecology, economics, genetics, management, physiology, soils, statistics, and wood science.

In most cases, a thesis is required, but it may be waived if such waiver will result in a more appropriate program for the individual student. The forestry seminar is required of all graduate students. There are no language or qualifying examination requirements.

Financial Aid. Besides University and other fellowships for which graduate students may compete, the Department of Forestry offers the Spaeth-Boggess Fellowship and a number of graduate research assistantships ranging from 25- to 67-percent time. Graduate assistants are exempt from tuition and the service fee, but not from the health service and insurance fees.

Research Interests. Major areas of faculty research include water quality and watershed management, nutrient cycling, ecology of forested bottomlands, tropical forest ecology, management of forest vegetation in stressed urban settings, resource education, remote

sensing, utilization of low-grade hardwood species and plant residues, forest tree improvement, population and molecular genetics of forest trees, properties of wood composite materials, wood mechanics, forest/soil relationships, atmospheric deposition effects on forest soils, symbiotic nitrogen fixation by trees and shrubs, modeling of forest growth, inventory and analysis, economics of multiple use, and economics and management of Illinois forests in particular and national forests in general.

FRENCH

Head of the Department: Paul Gaeng
Director of Graduate Studies: Emile Talbot
Correspondence and Information: Department of French, 2090 Foreign Languages Building, University of Illinois at Urbana-Champaign, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: H. De Ley, P. Gaeng, R.J. Nelson, S. Savignon, E. Talbot
Associate Professors: E. Accad, S. Gray, F. Jenkins, A.K. Mortimer, A. Omaggio
Assistant Professors: D. Kibbee, D. Lepetit, M. Rosello, S. Shinall

Graduate Degree Programs. The Department of French offers graduate courses leading to the Master of Arts and the Doctor of Philosophy. Candidates for the A.M. degree may specialize in literature, in expanded French studies, in French linguistics, or in the learning/teaching of French. Candidates for the Ph.D. degree may choose one of four specializations: literature, expanded French studies, French linguistics, or second-language learning and teaching.

Admission: Students are normally considered for admission to the A.M. program who have an overall undergraduate admission average of 4.0 (A = 5.0) with an average in French of 4.5. Students should normally have had a college major in French. Entering students are given a diagnostic test to determine whether remedial study in French language courses is necessary. Some knowledge of other Romance languages and literatures is desirable. Students seeking admission to the Ph.D. program with a Master of Arts degree earned elsewhere are expected to have a 4.5 grade-point average in graduate courses. The master's degree should be in French literature or in French studies. Candidates seeking admission to the Ph.D. concentration in second-language learning and teaching may hold an M.A.T. degree.

Master of Arts. Candidates in all master's programs must complete 8 units of course work and pass an A.M. examination. Candidates in literature must take an A.M. examination based on a reading list covering the field of French literature. The examination in expanded French studies covers, in addition to readings in the field of French literature, material bearing on the candidate's field of specialization in French culture or related disciplines. The examination in linguistics is based on a list of readings in linguistics and in literature. The examination in French learning/teaching includes readings in second-language acquisition and teaching methods in addition to selected readings in French literature and/or civilization. Candidates in all programs are required to demonstrate, at the time of the master's examination, an ability to communicate effectively in both written and oral French.

Doctor of Philosophy. Candidates in all programs must complete 16 units beyond the master's degree, including a minimum of 8 units of course work beyond the A.M. degree, and must pass a preliminary examination and write an acceptable thesis. Although teaching is not a general Graduate College requirement, the Department of French requires Ph.D. candidates to do some teaching as part of their academic work, as such experience is considered a vital part of the graduate program.

Ph.D. in Literature. This program is designed to prepare literary scholars and teachers. Candidates are required to include courses in research methods and textual criticism,

linguistics, old French, and French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

Ph.D. in Expanded French Studies. The doctoral program in expanded French studies allows for research in francophone literature or in the relation of French literature to some nonliterary discipline. Two of the required 8 units of course work beyond the A.M. degree may be taken in other departments or programs when available and approved by the graduate adviser. Candidates are required to include courses in French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

Ph.D. in French Linguistics. This is a graduate curriculum that offers training in French historical and descriptive linguistics and philology. Students in this program are required to take 3 units in French literature and may elect up to 2 units of related work in other departments, in addition to a required course in the structure of French and either the history of French or a course in Old French. At the doctoral level, a concentration in Romance linguistics is available in cooperation with the Department of Spanish, Italian, and Portuguese; the Department of Linguistics; and the Department of the Classics.

Ph.D. in Second-Language Learning/Teaching. An interdisciplinary concentration in second-language learning/teaching is available to candidates with an A.M. or M.A.T. degree in French and at least one year of experience in teaching French as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology, in addition to advanced study in French language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Financial Aid. Assistantships and University Fellowships are awarded. Several graduate students each year spend the school year in France under a graduate exchange agreement with the French government. The department has also initiated exchange programs with the University of Metz and the University of Dijon, France, and the University of Liege, Belgium.

GENERAL ENGINEERING

Head of the Department: T.F. Conry
Correspondence and Information: L.D. Metz, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, 104 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: T.F. Conry, J.S. Dobrovolny, E.N. Kuznetsov, J.V. Medanic, L.D. Metz
Associate Professors: O. Coskunoglu, W.J. Davis, W.B. Hall, M.H. Moeinzadeh, M.H. Pleck, H.L.M. Reis, M.W. Spong, T.R. Woodley, L. Wozniak
Assistant Professors: S.A. Burns, J.V. Carnahan, M.G. Strauss, S.D. Thompson, D.L. Thurston

Graduate Degree Program. The Department of General Engineering offers graduate study leading to the degree of Master of Science. The program consists of a core of required courses including a design thesis or project with supplementary courses selected by the student together with his/her advisor.

The master's degree program in general engineering is intended for students interested in engineering project planning and execution, stressing the design function for manufacturing. The program thus offers an approach to engineering that crosses disciplinary lines. Graduates of the program are prepared to enter professional engineering positions in industry, government, and private practice. The program is designed to accommodate the student who considers the M.S. as the terminal degree.

Admission. Applicants who have completed degree requirements in an accredited engineering program or its equivalent are eligible to apply for admission. Qualifications for admission include a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work.

Master of Science. The minimum requirement for the degree is 8 units of credit with a thesis or 9 units without a thesis. Each candidate must successfully complete a minimum of 2 units of project design for the nonthesis degree or one unit of thesis research for the thesis degree. Each candidate must also successfully complete at least 7 additional units of graduate course work, of which at least 3 units must be at the 400-level.

It is possible to pursue the M.S. in General Engineering and the M.B.A. degree simultaneously. The total time required is less than that needed to obtain both degrees independently. A total of 18 units of credit is required, including 4 units of work consistent with normal M.S.G.E. requirements, 12 units of M.B.A. core courses and 2 units of project design, GE 497. Separate admission to both departments is required, although only one application is necessary.

There also exists an extramural M.S.G.E. program which is available to off-campus students in videotape and telecommunications format.

Financial Aid. Qualified students may apply for financial aid in the form of teaching and research assistantships and waivers of tuition and service fees.

Research Interests. The research interests of the faculty include reliability, design optimization, biomechanics, robotics, systems dynamics and simulation, human factors in design, operations research/management science, computer graphics in design and applied mechanics.

GEOGRAPHY

Head of the Department: G.J.D. Hewings
Correspondence and Information: Graduate Advisor, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, 607 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.D. Fellman, A. Getis, B.M. Hannon, G.J.D. Hewings, J.A. Jakle, J. Thompson
Associate Professors: T.D. Frank, J.O. Huff, D.L. Johnson, J.V. O'Loughlin, C.E. Thorn
Assistant Professors: T.D. Bassett, A.P. Elhance, B.L. Rhoads

Graduate Degree Programs. The Department of Geography offers work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. The department's specializations are organized into five programs: (1) economic geography/regional science (industrial location, transportation, techniques of urban and regional analysis, urban systems); (2) historical and cultural geography (historic landscapes, urban morphology, cultural ecology of economic development, technology and environmental change); (3) geomorphology (fluvial, periglacial, soil, Quaternary Studies); (4) political and urban geography (development theory, international conflicts, migration, urban systems); and (5) cartography and remote sensing (thematic cartography, biophysical remote sensing, G.I.S.). Detailed descriptions of these programs may be obtained from the department office.

Admission. Students applying for admission to the master's program are expected to have a strong undergraduate background in geography and/or related disciplines. In addition to other Graduate College admission requirements, a grade-point average of at least 4.0 (A = 5.0) in the undergraduate major is required. Ph.D. candidates are generally expected to have at least a 4.5 average in previous graduate work.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the Master of Science; others receive the Master of Arts. The Graduate College requirements for the master's degree apply.

Doctor of Philosophy. Admission presupposes distinction in completing the master's program in geography or its equivalent at the University of Illinois at Urbana-Champaign. In the doctoral program, the student develops depth in the program chosen for specialization and further advances in research competence. Of the 16 units required beyond the master's degree, 4 units of study in allied disciplines and a minimum of 6 additional units in geography are required. A student must complete the course requirements as determined by an individually planned program, initiate and complete research projects, and qualify for candidacy by passing the preliminary examination. Although there is no departmental foreign language requirement, students may offer a foreign language as a research technique.

Financial Aid. Fellowships and teaching and research assistantships are available in the department. See the section on financial aid for a description of the provisions of these awards.

Departmental Facilities. The department houses several laboratories: 1. the Spatial Data Analysis Laboratory is a facility for analysis of spatial patterns derived from maps, aerial photographs, and satellite images using computer cartography/image processing work stations; 2. the Cartography Laboratory has darkroom and drafting facilities; 3. the Soil Laboratory includes an X-ray diffractometer and a vacuum spectrometer.

Map and Geography Library. Contained within the University's outstanding library is the Map and Geography Library which has an excellent collection of geography monographs, periodicals, and more than 500,000 maps and aerial photographs.

GEOLOGY

(Including Earth Science)

Head of the Department: David F. Anderson

Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois at Urbana-Champaign, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.F. Anderson, T.F. Anderson, D.B. Blake, A.V. Carozzi, R.L. Hay, D.M. Henderson, W.H. Johnson, R.J. Kirkpatrick, G. deV. Klein, R.L. Langenheim, C.J. Mann, P.A. Sandberg

Associate Professors: C.M. Bethke, W.P. Chen, A.T. Hsui, A.S. Nieto

Assistant Professors: S.P. Altaner, J.D. Bass, C.Y. Chen, R. Cygan, S. Grand, S. Marshak

Graduate Degree Programs. The Department of Geology offers programs leading to the Master of Science and Doctor of Philosophy in Geology and the Master of Science in the Teaching of Earth Science. Programs in carbonate geology; clay mineralogy; engineering geology and rock mechanics; geochemistry; geophysics, geomorphology and Quaternary geology; hydrogeology; marine geology; mathematical geology; mineralogy; igneous, metamorphic, and experimental petrology; paleontology; stratigraphy; sedimentology and sedimentary petrography; structural geology; and transport processes give students a wide choice of courses and areas of specialization.

Admission. The admission requirements of the Graduate College apply. In addition, the aptitude test and one advanced test (e.g., geology, physics, chemistry or biology) of the Graduate Record Examination are required for admission to graduate work in geology. Geology majors having at least a year each of biology, calculus (preferably three semesters), chemistry and physics are given preference, but students from cognate fields are encouraged to apply. For more information, write the Educational Coordinator.

Master of Science. The M.S. degree requires a minimum of 8 units of credit, of which 2 units are normally research credit for a satisfactory master's thesis. Students continuing on for the Ph.D. degree may petition to bypass the writing of a master's thesis and,

upon passing the preliminary examination, may petition to receive the M.S. degree. In exceptional circumstances, terminating students may petition to obtain the M.S. degree without completing a thesis. At least 3 units of course work must be taken within the department, and at least 3 units must be completed at the 400-level. A student must maintain a minimum grade-point average of 4.0 (A = 5.0) during the master's program. In addition, each student must pass a written comprehensive examination. The program is normally completed in one to two years.

Master of Science in the Teaching of Earth Science. Candidates must earn 8 units, including 4 units in geology, 2 units in other earth science areas, and 2 units in education. At least 3 units must be at the 400-level. In addition, candidates must fulfill the requirements to be certified to teach at the secondary school level in Illinois. A student must maintain a minimum grade-point average of 4.0 (A = 5.0) during the master's program. In addition, each student must pass a written comprehensive examination.

Doctor of Philosophy. The Ph.D. degree requires an additional 8 units of course work beyond the requirements for the master's degree and the completion of a satisfactory thesis, including 8 units of research and seminar. At least 4 of the 8 additional course units must be taken within the department and at least 3 of these units must be at the 400-level. At least 2 courses (totaling at least 1½ units) must be taken outside the geology department. A Ph.D. candidate must maintain a minimum grade-point average of 4.0 (A = 5.0) during all of his or her graduate work. A reading knowledge of German, Russian, or French is required. There are three faculty assessments of students' academic ability and progress; a written comprehensive, the preliminary, and the final examination. The written comprehensive examination surveys a student's background and preparation, and the results are used in planning individual programs. The preliminary examination is focused on a student's proposed research for the thesis and tests the student's preparedness for the proposed research. The final examination evaluates a student's research ability as demonstrated by the completed thesis. The doctoral program is normally completed in two to four years beyond the master's degree.

Financial Aid. Candidates for graduate degrees may be supported through teaching assistantships, research assistantships, fellowships, waivers of tuition and service fees, and work-study programs. Fellowships and assistantships include tuition and fee waivers. Awards for financial assistance are based principally on a candidate's academic record, statement of plans, and letters of reference. Some part-time assistants are employed by the State Geological Survey located on campus.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: James M. McGlathery

Correspondence and Information: Head, Department of Germanic Languages and Literatures, University of Illinois at Urbana-Champaign, 3072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, U.H. Gerlach, H.G. Haile, W. Hollerer, M. Kalinke, H. Knust, R. Lorbe, J.W. Marchand, J.M. McGlathery

Associate Professors: M. Burkhard, K.-H. Schoeps, R. Wright

Graduate Degree Programs. The Department of Germanic Languages and Literatures offers graduate programs leading to the degrees of Master of Arts, Master of Arts in the Teaching of German, and Doctor of Philosophy.

Master of Arts. Applicants should have completed undergraduate studies similar to the concentration in German at the University of Illinois at Urbana-Champaign, have a grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate course work plus any graduate work completed, and be able to follow lectures in the German language. Acquaintance with German history and culture in their relation to the general European background is desirable. Admission to the program is on a competitive basis.

Candidates for the Master of Arts in Germanic Languages and Literatures may emphasize either German or Scandinavian literature or linguistics. All candidates must take course work in both literature and linguistics.

Eight units of graduate work are required, although deficiencies in undergraduate preparation may necessitate more than 8 units to meet the requirements. Residence and other requirements of the Graduate College must be met. Candidates for the A.M. Degree must demonstrate proficiency in reading one language other than English and German (normally French). Required courses (or approved equivalents) are: German 365 and 366 (Structure of the German Language I, II), German 311 and 312 (German Literature 750-1770), German 415 (Middle High German) or Scandinavian 405 (Old Norse-Icelandic), German 420 (History of the German Language), German 410 (Introduction to Graduate Study), and two graduate literature courses on the 400-level. Electives may be chosen from within or from outside the department with the approval of the graduate adviser. The degree is awarded upon the successful completion of a three-hour written and a one-hour oral comprehensive examination, or upon successful defense of a thesis. More detailed information may be obtained from the departmental office.

Master of Arts in the Teaching of German. Applicants must meet the same admission standards as those for the Master of Arts in German. Candidates for the M.A.T. degree must earn 5 units in German emphasizing either language and linguistics or literature and culture, 2 units in approved courses in educational policy studies, 1 unit of studies in educational foundations, and 2 courses in foreign language education. Candidates must also complete all undergraduate requirements for a teaching certificate, although no graduate credit is given for undergraduate courses. In some cases, with proper advance approval, graduate courses may be applied to the teaching certification requirements. Residence requirements are those of the Graduate College. The degree is awarded after the successful completion of a three-hour written and a one-hour oral examination. More detailed information is available from the departmental office.

Doctor of Philosophy. Applicants must meet the admission standards outlined for the Master of Arts and, in addition, hold a Master of Arts in German (or equivalent) with a graduate grade-point average of 4.5 (A = 5.0). Admission to the program is on a competitive basis.

Candidates for the Ph.D. in German may specialize in older German literature, modern German literature, or Germanic linguistics.

Students working toward the Ph.D. degree must have completed all requirements for the A.M. degree given above and complete an additional 8 units of course work approved by the graduate adviser. Residence requirements are those of the Graduate College. Candidates must demonstrate proficiency in reading two languages other than English and German that are considered useful in their area of specialization.

After passing the written preliminary examinations (three three-hour comprehensive examinations), the student is admitted to the oral examination, the successful completion of which admits the student to candidacy for the Ph.D. degree. The candidate must then complete 8 units of thesis research and successfully defend the thesis in an oral examination. All candidates for the Ph.D. degree must have taught the equivalent of three one-semester courses on the college level (i.e., teaching one-half time for one academic year) before being admitted to the final oral examination (thesis defense). An additional option in Second Language Acquisition in Teacher Education (SLATE) is available to candidates with an A.M. degree (or equivalent) in German and at least one year of experience in teaching German as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology in addition to advanced study in German language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics. More detailed information is available from the departmental office.

Financial Aid. Teaching assistantships are awarded on a competitive basis to promising candidates with a strong academic record. Preference may be given to students who have lived in a German-speaking country or have had some teaching experience. Teach-

ing assistantships are normally awarded one-half time for the academic year. Each year the department may nominate one or two outstanding students for a University Fellowship. A limited number of tuition and service fee waivers may also be available. Full details on amounts of financial aid and time limitations for eligibility may be obtained from the departmental office.

For continuing graduate students, the awarding of financial aid of all types is contingent upon the maintenance of satisfactory progress toward a degree.

Research Interests. The department faculty includes nationally and internationally recognized scholars in all areas of research within the field, including older and modern German literature, medieval studies, Scandinavian literature, German film, computerized instruction, and historical and synchronic Germanic linguistics. The University Library has one of the nation's outstanding collections of works pertaining to study and research in German and other literatures of all periods and in Germanic and general linguistics.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: Robert F. Rich
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.F. Giertz, S.K. Gove, P.F. Nardulli, R.F. Rich

The Institute of Government and Public Affairs conducts policy-oriented research and public service. Primary emphasis is on research into public policy issues at the state and local level, especially as these relate to Illinois. Public service activities arise from and contribute to the research thrust through contact with public officials and the identification of research problems. Each year the institute has several affiliate faculty members from related University of Illinois at Urbana-Champaign departments, as well as from other universities. The institute offers no courses, but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research are published in internal and external journals and books.

HEALTH AND SAFETY STUDIES

Head of the Department: R. Warwick Armstrong
Correspondence and Information: Director of Graduate Studies, Department of Health and Safety Studies, University of Illinois at Urbana-Champaign, 114 Huff Hall, 1206 South Fourth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R.W. Armstrong, W.H. Creswell, Jr., P.B. Imrey, R.G. Mortimer, L.B. O'Reilly, T.W. O'Rourke, D.B. Stone
Associate Professors: A.M. Flood, L. Rubinson
Assistant Professors: R.L. Goldstein, D.M. Macrina, S.B. Montgomery, N.S. Van Winkle

Graduate Degree Programs. The Department of Health and Safety Studies offers programs of study leading to the Master of Science and Doctor of Philosophy degrees. At the master's degree level, the program offers options in epidemiology, health behavior, school health, and community health education. The community health program has been accredited by the Council on Education for Public Health. The Ph.D. program is designed to prepare graduates for positions of leadership in teaching, research, and service in universities, industries, and private and government agencies in the United States and in other countries. Opportunities are available for graduate students who desire to concentrate in additional public health areas through an intercampus program with the School of Public Health, University of Illinois at Chicago.

Admission. The Graduate College admission requirements apply for all applicants. Candidates wishing admission to the M.S. program will have their grade-point averages computed for their last 60 semester hours of undergraduate courses (excluding student teaching, field work, or activity courses). In addition, satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination are required.

The admission requirements for the Ph.D. program include the following: an acceptable grade-point average in the last 60 hours of undergraduate course work (not including student teaching, field work, or activity courses), an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test, and satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination. Candidates are required to have a personal interview with the director of graduate studies or other representatives of the department. Preference is given to students who have had at least two years of professional experience.

Master of Science. The specializations in epidemiology, health behavior, and school health require a minimum of 8 units of graduate credit. Three units must be at the 400-level with two of these units in Health and Safety Studies courses. The program includes completion of three units of core courses (HSS 310, 329, 374 and 440) which are intended to provide overall knowledge of the public health field and the tools necessary for successful functioning as a health specialist. A thesis (1 to 2 units) is required. Students will be expected at entry to the program to have completed undergraduate coursework in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through multiple regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional coursework, as necessary, for successful completion of the Master of Science degree.

The specialization in community health education is accredited by the Council on Education for Public Health. The program generally takes two years depending upon prior education and experience. A minimum of 12 units of graduate credit is required. Three units must be at the 400-level with two of these units in Health and Safety Studies courses. The program includes 6½ units of required courses which are intended to provide an overall knowledge of the public health field and the tools necessary for successful functioning as a community health education specialist; 2 units of field work experience in the summer; and a thesis (1 to 2 units). Students will be expected at entry to the program to have completed undergraduate coursework in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional coursework, as necessary, for successful completion of the degree.

Doctor of Philosophy. A master's degree with a thesis or equivalent is required for applicants to the Ph.D. program. Graduate course experience in public health, safety, ecology, epidemiology, and statistics with grades of B or better is expected prior to admission. Before admission to the Ph.D. program, students may be required to take up to 3 units of additional course work to remedy deficiencies. Candidates for the degree must complete a minimum of 16 units of credit beyond the master's degree, including the following: two Health and Safety Studies 400-level courses in area of specialization; one Health and Safety Studies 490 research seminar; one 400-level course in advanced quantitative methods; one minor for a minimum of 4 units, or two minors for a minimum of 2 units each (in both cases outside the major field); and completion of an acceptable dissertation (8 units). In addition, candidates must demonstrate the ability to speak and read in two foreign languages, or complete 4 units of research skill courses; or demonstrate the ability to speak and read in one foreign language and complete 2 units of research skill courses. The candidate is required to pass written preliminary examinations covering health and safety, application of social science, epidemiology and ecology, research and quantitative methods, the major area of specialization, and the minor field; to pass an oral preliminary examination on the area of specialization and dissertation proposal; and to pass an oral defense of dissertation research.

Financial Aid. Financial aid is available on a competitive basis to qualified students in the form of teaching and research assistantships and tuition and service fee waivers.

Faculty Research Interests. Faculty research interests cover a wide range including, but not limited to, health education, school health, community health development, health behavior, health policy, health planning and management, life-span development, elderly care, human factors, safety and accident prevention, environmental health, occupational health, epidemiology, biostatistical and epidemiologic research methodology, and evaluation research.

Medical Scholars Program. This program allows the student interested in medicine and health and safety to earn both the M.D. and Ph.D. (health and safety studies) degrees while gaining multidisciplinary research experience. Individually tailored programs can be developed within the requirements of both programs. Degree work will be arranged to accommodate the schedules of both programs. However, the course of study in health and safety will be equivalent to that of all other doctoral candidates. Contact the Associate Dean, School of Basic Medical Sciences and Clinical Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801, for further information regarding the Medical Scholars Programs.

HISTORY

Chairperson of the Department: William C. Widenor
Director of Graduate Studies: Charles C. Stewart
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: W.L. Arnstein, R.M. Berdahl, P.P. Bernard, R.W. Burkhardt, Jr., D.E. Crummey, C.E. Dawn, L.E. Eastman, P.B. Ebrey, W.D. Farnham, R.T. Fisher, Jr., K.A. Hitchins, F.C. Jaher, R.C. Jennings, R.W. Johannsen, R.A. Jones, B.B. Kling, J.L. Love, R.M. McColley, J.P. McKay, J.A. Nichols, N.G. Parker, D.E. Queller, P.W. Schroeder, W.U. Solberg, C.C. Spence, C.C. Stewart
Associate Professors: J.R. Barrett, J. Buckler, O.V. Burton, C.M. Hibbard, D.P. Koenker, J.A. Lynn, E.M. Melhado, R.E. Mitchell, D. Prochaska, J.H. Pruett, M.L. Spence, R.P. Toby, B.P. Uroff, J.E.K. Walker, W.C. Widenor
Assistant Professors: N. Jacobsen, M.H. Leff

Graduate Degree Programs. The Department of History offers graduate courses leading to the Master of Arts and the Doctor of Philosophy, complete details of which may be found in the department's brochure on graduate study in history. The Master of Arts degree may be either the first stage in preparation for the degree of Doctor of Philosophy or a terminal degree. A special program for teacher training is available, the Master of Arts in the Teaching of Social Studies (see page 147).

Approved areas of specialization are: ancient Greece; ancient Rome; medieval; Renaissance and Reformation; Europe and dependencies, 1648-1815; Europe and dependencies since 1815; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; early America to 1830; United States since 1815; Latin America; history of science; history of international relations since 1871; military history; Afro-American history, native American history; history of medicine; and history of women. Topical fields may also be arranged with the consent of the graduate advisers.

Admission. For the A.M. program: an average of 4.0 (A = 5.0) during the last two years of undergraduate work, a reasonable amount of course work in history, and Graduate Record Examination scores (verbal and quantitative mandatory; history optional). For the Ph.D. program: an average of 4.5 for previous graduate-level work and

Graduate Record Examination scores (as above). Undergraduate language preparation may be weighted heavily depending upon field of specialization.

Master of Arts. Candidates are expected to take at least 2 units in each of two of the fields of specialization listed above. A minimum of 8 units is required, 4 of which must be at the 400-level (excluding History 498). One of the 8 units must be History 490 (history and social theory), 491 (quantitative history), or 496 (historiography). At least one research seminar with a grade of B or better must be included. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement and may carry no more than 2 units of credit. A candidate must demonstrate ability to read one foreign language related to his or her field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the Ph.D. degree needs a minimum of 24 units (including those offered for the A.M. degree), of which 8 may be for thesis research (History 499). For students who enter the graduate program without an A.M. in history, these must include three research seminars, History 496, either History 490 or History 491, and three additional courses at the 400-level (not including History 499). For students entering the graduate program with an A.M. in history, these must include two research seminars, History 496, either History 490 or History 491, and two additional courses at the 400-level (not including History 499). History 498, while required for students serving as teaching assistants, cannot be counted toward fulfilling these requirements. A candidate must demonstrate ability to read two foreign languages related to his or her field of interests, as approved by the graduate advisers. In certain circumstances, a student in American or British history may substitute courses in quantitative skills for the second language. For the preliminary examination, the candidate will customarily offer four fields in history, of which one must involve a period of time prior to 1815. At least two geographical areas must also be represented by the fields offered for the examination. One of the four fields, however, may be in a specialization outside the Department of History or may be a field of history specially designed by the candidate in consultation with the major adviser (e.g., United States intellectual or European economic history). Four units in disciplines other than history may be applied to fulfill the minimum requirement of 24 units.

Concentration in the Area of American Civilization. The Department of History administers an interdisciplinary doctoral program in American civilization. Students are required to take, among their 16 units prior to preliminary examinations, at least 4 units in American history, 3 in literary studies, 2 in the fine arts, and 2 in the social sciences. Course work may be arranged to allow specialization in such interdisciplinary fields as popular culture, urban studies, regional studies, folklore, film, women's studies, and minority cultures. Students may earn a master's degree in American civilization by taking 8 units, including 3 in history, 2 in literature, and 2 in either the fine arts or the social sciences. At least 4 of these units must be at the 400-level, and one should represent an interdisciplinary research project. Students apply for admission and financial aid through the Department of History.

Concentration in the Area of History and Philosophy of Science. The departments of History, Philosophy, and Sociology jointly offer, for work toward the A.M. and the Ph.D. degrees, a special area of concentration in history, philosophy, and sociology of science. Students interested in this program will enroll in and receive their degrees from either the history, the philosophy, or the sociology department depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history, philosophy, or sociology is normally desirable, so also is a strong background in science, and students with such backgrounds, but only weak training in history, philosophy, or sociology will be considered for admission. The admission procedure is the same as that stated for each of the three departments, as is the information to be submitted with each application for admission. For students in this special concentration, the normal departmental requirements for the A.M. and Ph.D. degrees are modified. Further information is available from the Department of History.

Financial Aid. Financial aid is almost always awarded on an academic-year basis. Applications are due in the department office by January 15. All fellowships and assistantships involve a stipend plus tuition and service fee waiver.

Fellowships. Available fellowships include University Fellowships for entering A.M.-level students and for Ph.D.-level students at the dissertation writing stage, Babcock Fellowships for dissertation-level students, Foreign Language and Area Studies (NDEA VI) Fellowships for those who have special interests in foreign area studies, and Graduate College Fellowships for beginning students who have disadvantaged backgrounds.

Teaching Assistantships. Half-time teaching assistantships are the department's primary form of financial aid to graduate students admitted to the Ph.D. program. Students who make satisfactory progress toward their degree and demonstrate effective teaching will have their teaching assistantships renewed for a second and, in some cases, a third year.

Tuition and Service Fee Waivers. A number of tuition and service fee waivers are available each year both to entering and continuing students at the A.M. and Ph.D. levels.

HISTORY, PHILOSOPHY, AND SOCIOLOGY OF SCIENCE

Graduate Degree Program. An interdisciplinary concentration in the history, philosophy and sociology of science is available leading to the Doctor of Philosophy degree. Students for this program enroll in either the Department of History or the Department of Sociology. Further information may be obtained from those departments.

HORTICULTURE

Head of the Department: D.B. Dickinson
Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 1201 S. Dorner Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.B. Dickinson, W.L. George, C.A. Rebeiz, D.S. Seigler, W.E. Splittstoesser, L.A. Spomer, J.S. Titus, D.J. Williams
Associate Professors: J.O. Dawson, T.W. Fermanian, J.M. Gerber, G.J. Kling, M.M. Meyer, S.M. Ries, R.M. Skirvin, J.M. Swiader, D.J. Wehner
Assistant Professors: B.A. Eisenberg, J.A. Juvik, S.L. Knight, S.S. Korban, J.B. Masiunas, M.A.L. Smith, J.G. Sullivan

Graduate Degree Programs. Graduate work is offered in the Department of Horticulture leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in any phase of horticulture (fruit and vegetable crops, ornamentals, and turf) including breeding and genetics, culture and production, weeds and their control, environmental physiology, biochemistry, developmental anatomy and morphology, tissue culture, or marketing. A well-balanced program may include courses in agronomy (crops and soils), plant biology, food science, genetics, statistics, entomology, plant pathology, chemistry, biochemistry, agricultural economics, and agricultural communications.

Admission. Applicants should have a bachelor's degree in horticulture or equivalent preparation in the plant sciences and must meet the Graduate College requirements for admission.

Master of Science. A candidate must complete a minimum of 8 units of graduate study with a grade-point average of at least 4.0 (A = 5.0); at least 4 units must be in the 400 series of courses. Thesis and nonthesis options are available; however, the thesis option is preferred and is required of all research assistants. Any request for the nonthesis option is considered on its individual merit by the graduate committee of the department.

Doctor of Philosophy. The candidate must complete a minimum of 8 units of course work beyond the master's degree and pass a preliminary examination. The candidate must also complete 8 units of thesis research, submit an acceptable thesis, and defend it in an oral examination. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee. Additional details of departmental graduate degree requirements are described in a pamphlet available from the Department of Horticulture.

Financial Aid. Various support moneys available on a competitive basis include University Fellowships, College of Agriculture fellowships, research and teaching assistantships, and waivers of tuition and service fees.

HUMAN RESOURCES AND FAMILY STUDIES

Director of the School: Sharon Y. Nickols

Correspondence and Information: School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 274 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. Birch, B.P. Klein, F.M. Magrabi, S. Nickols, L.B. O'Reilly, S. Salamon

Associate Professors: A.H. Beller, H.M. Buckley, J.S. DeLoache, N.J. Fisher, J.L. Hafstrom, D.K. Layman, B.J. Peterson, M. Raheel, R.J. Reber

Assistant Professors: M.A. Carll-White, C.J. Carpenter, B.J. Cude, S.U. Douglas, V.R. Fitzsimmons, R. Hughes, K.S. Keim, R.W. Larson, K.K. Leonas, M.A. Morganosky, M.A. Paynter, S.J. Richardson, W.H. Sander III, K.W. Singletary, C.M. Todd, J.L. Wysocki

Graduate Degree Programs. The School of Human Resources and Family Studies offers graduate work leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. Master's degree programs are available in family and consumption economics, foods and nutrition, general human resources and family studies, human development and family ecology, and textiles and apparel. Requirements for these are listed under the individual programs.

For the master's degree in human resources and family studies, all candidates must complete a minimum of 8 units (9 if a thesis is not submitted) of which at least 4 must be in human resources and family studies. Four of the total units, including at least 2 in human resources and family studies, must be in 400-level courses.

The minimum grade-point average for admission is 4.0 (A = 5.0). Additional requirements are listed under the individual programs.

INDIVIDUAL DEGREE PROGRAMS

Family and Consumption Economics. The family and consumption economics programs are interdisciplinary. Admission requirements include one semester of principles of economics, a course in applied statistics, and one in calculus. Major areas of faculty research include satisfaction related to levels and standards of living and quality of living for families and individuals, and human capital with emphasis on education and employment of women.

Master of Science. The M.S. program requires 3 units from family and consumption economics, 2 units of thesis from Family and Consumption Economics 499, 2 units of economic theory at the 400-level, and 1 unit of research methods.

Doctor of Philosophy. Requirements include: (1) 5 units from family and consumption economics; 1 unit each of macro- and micro-economic theory with a grade of at least a B in each; 2 to 4 units at the 400-level from economics, or economics and agricultural economics; 2 units of statistics; 1 unit of research methods; 8 units of thesis, Family and Consumption Economics 499; (2) two of the three stages in residence; and (3) one written examination in family economics and one in consumption economics.

Foods and Nutrition. Major areas of faculty research interest include human nutrition through the life cycle; nutritional aspects of exercise; nutrient metabolism; nutrition and immunity; nutrition education; nutrient composition of foods; food service systems; sensory and instrumental evaluation of food quality; food biochemistry; and use of alternative protein sources in human food.

Master of Science. The department offers two areas of emphasis for the M.S. degree: foods and nutrition, and food service systems. For admission, candidates must have training in organic and inorganic chemistry, algebra, microbiology, and physiology, as well as an undergraduate course in both foods and nutrition with organic chemistry prerequisites. Deficiencies must be removed during the first year of graduate study. For both emphases, a minimum of 8 units, of which at least 4 must be in foods and nutrition, must be completed. Four of the total units, including at least 2 in foods and nutrition, must be in 400-level courses. Thesis topics may be in foods, nutrition, or food service systems. Specific entrance requirements and course work required for each area are given below. Additional courses may be taken in foods and nutrition or related areas.

In the foods and nutrition emphasis, a course in quantitative analytical chemistry is an additional requirement for entrance. Graduate-level courses required include biochemistry with laboratory, biochemical nutrition, experimental study of foods and seminars in foods and nutrition. In the food service systems emphasis, introductory courses in accountancy, business administration, and economics are additional requirements for entrance. Required foods and nutrition graduate-level courses include the experimental study of food; quantity food purchasing, production, management and service; and seminars in foods and food service systems. In addition, personnel management, business organization, and marketing courses at the graduate level are required.

Doctor of Philosophy. For admission, in addition to the prerequisites listed above for the master's degree, a candidate must have taken courses in calculus and physics. Twenty-four units of graduate work must be completed; at least 8 and no more than 12 units of thesis research may be applied to the requirements. If a candidate has a master's degree in foods and nutrition or a related area, a minimum of 16 units, including up to 12 units of thesis research, must be completed. Required courses include at least 3 units of foods and nutrition, of which at least 2 must be at the 400-level. Students must take seminars in foods, nutrition, or food service systems. Other courses are selected on the basis of the student's background and interests, in consultation with the adviser. Courses may be chosen from foods and nutrition, food science, biological and chemical sciences, statistics, or other related areas. Thesis topics may be in foods or nutrition.

General Human Resources and Family Studies. The master's program in general human resources and family studies allows the candidate to obtain greater breadth than is possible in one of the more specialized areas. Candidates are required to take a minimum of 4 units from prescribed courses in three of the five specialized fields in human resources and family studies. Students interested in interior design are advised in this program.

Interior Design. For the M.S. or M.A. with a concentration in interior design, the student may specialize in the study of design, history of furniture and interiors, environmental analysis, or a closely related topic. Major areas of faculty research include: residential and commercial interior design, period or adaptive re-use restoration, history of furniture and interiors, and personal space. Applicant should have an undergraduate major in interior design or a background in a related field. Deficiencies should be made up during the first year of graduate study. Basic courses in art, natural sciences, economics, sociology, psychology, interior design, and textiles are essential. The master's degree with a concentration in interior design may be completed with a thesis or design problem. The graduate program must include ID 485, 493, and 499, and a minimum of two additional units in interior design at the graduate level.

Home Economics Education. The M.S. program in home economics education requires that candidates hold a valid teaching certificate for home economics or have successfully

completed Illinois certification requirements, and earn at least 8 units of graduate credit, of which 4 units are in human resources and family studies. Three of the 8 units must be at the 400-level, with at least 1 of these in human resources and family studies. Four ½-unit courses are specified in educational psychology and educational policy studies. At least 2 units must be in home economics education. Advisers for students in this program are in the Division of Home Economics Education, College of Education. A thesis is recommended.

Human Development and Family Ecology. The degree programs are interdisciplinary, focusing on individual development across the life span and on the family context in which development occurs. Major areas of faculty research in human development include childhood, adolescence, and aging; in family studies emphases include family systems, the family in cross-cultural settings, and the relationship between the family and other institutions in society.

Admission. Admission into all programs is based on a combination of criteria. All applicants are required to submit Graduate Record Examination scores and have previous course work in an area of the behavioral or social sciences. A student without prior course work in human development, family studies, and advanced level research methods and statistics may be admitted to the graduate programs, but will be required to make up deficiencies during the first year of the program.

Master of Science or Master of Arts. For the M.S. or A.M. degree, the student may specialize in the study of either the family or human development. The program is designed to prepare students as practitioners in education and social service agencies or as the first step toward the doctorate. Students must complete a minimum of 8 units, including 2 units of thesis, or 9 units if the thesis is not submitted. Four of the total units must include HDFE 418 and 419 and two other 400-level courses.

Master of Science and Master of Social Work. A joint master's degree program offered in conjunction with the School of Social Work, is designed to prepare students for careers as marital and family therapists within a human service agency, or as independent practitioners, teachers, or clinical researchers. For admission to the M.S./M.S.W. joint degree program, students must apply to both the Division of Human Development and Family Ecology, and the School of Social Work, and must meet the standards for admission and be approved by both. Completion of the program meets the requirements for associate membership in the American Association for Marriage and Family Therapy. Students in the HDFE phase of the program take course work in family studies, human development, and family systems to fulfill the requirements for the M.S. They then fulfill requirements for the M.S.W. Students who hold a B.S.W. degree must complete a minimum of 20 units of course work to satisfy requirements for the M.S.W. and M.S. degrees. Students with baccalaureate degrees in other disciplines may need to complete up to 22 units if they lack certain social work credits as undergraduates.

Doctor of Philosophy. The program is designed to prepare students to be researchers, educators, policy developers, or practitioners in human services delivery. Requirements for the Ph.D. include 16 units beyond the M.S. or M.A., a predissertation research paper, a preliminary written examination designed by the student's faculty committee, an examination of the dissertation prospectus, and a final oral defense of the dissertation administered by the same committee. The student selects human development or family studies as the major area of concentration; the other division area serves as a minor area of concentration. A cognate area is selected from outside the division. Course work in areas such a anthropology, family economics, sociology, psychology, educational psychology, early childhood education, or social work, selected in consultation with the student's advisor, can satisfy program requirements within the student's area of specialization and in the cognate area. Two units in advanced research methodology and/or statistics, HDFE 420, HDFE A421, and 8 units of thesis are required.

Textiles and Apparel. For the M.S. or M.A. degree in textiles and apparel, the student may specialize in the study of aesthetic aspects of apparel, economics, international studies, social psychology of dress, textile science, or textiles and apparel marketing.

Major areas of research include aesthetic theory, cognitive and interpersonal factors influencing apparel selection, cognitive processes in perceptions of dress, consumer behavior, dress as a stimulus in social situations, industry labor and technology, performance evaluation of consumer textile products, protective clothing, safety aspects of textiles, and consumer values.

Master of Science or Master of Arts. Admission requirements include a background in textiles, apparel, and associated courses. Deficiencies should be made up during the first year of graduate study. The graduate program must include a minimum of eight units, or nine units if a thesis is not submitted; at least four of the total units must be in textiles and apparel and four at the 400-level. A graduate level statistics and a research methods course are also required. Additional courses are selected in accordance with the special interests of the student.

Financial Aid. University Fellowships and fellowships in the College of Agriculture, tuition and service fee waivers, research assistantships, and teaching assistantships are available in several programs.

JOURNALISM

Acting Head of the Department: James W. Carey
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J. Carey, T. Littlewood, C. Christians
Associate Professors: S. Helle, R. Reid, C. Whitney

Graduate Degree Program. The Department of Journalism offers graduate work leading to the Master of Science degree. The department does not offer a Ph.D. degree. For the program leading to the Doctor of Philosophy in Communications, see page 79.

Admission. Applicants must have a bachelor's degree from an accredited U.S. institution or one of recognized standing abroad. A grade-point average of 4.0 (A = 5.0) is the minimum requirement for admission to the Graduate College, with exceptions by petition only. Because the master's program has an enrollment ceiling, some applicants with grade-point averages of 4.0 or higher may not be admitted. It is imperative that all applicants supply writing samples. Letters of recommendation and the Graduate Record Examination are required. If possible, a personal interview with the head of the department or director of graduate studies is also helpful.

Master of Science. The following are requirements for the degree: (1) A major of 4 units or 3 units and 1 additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience are required to complete 1 unit of news editing (either news-editorial or broadcast news editing), 2 units in news writing, and 1 unit of either graphics and photojournalism, television, or radio news production. (2) A thesis, or preparation of a topic in journalistic form for publication or broadcast, for 1 unit. (3) A minimum of 3 units in courses at the 400-level, at least 2 of which must be in journalism. (4) A minimum total of 8 units with a grade-point average not lower than 3.875.

Financial Aid. See the description of the University Fellowship and tuition and service fee waiver program in the introductory section of this catalog. Assistantships (teaching or research) are awarded on a one-quarter-time to two-thirds-time basis and carry a waiver of tuition and some fees. To be considered for financial aid, applications, including transcripts and three letters of recommendation, must be received no later than February 15. Students with journalism degrees or professional experience may become candidates for part-time positions in other units of the University that require journalistic skills in writing, editing, and/or photography and graphics.

KINESIOLOGY

Head of the Department: Karl M. Newell

Correspondence and Information: Director, Graduate Studies Program Office, Department of Kinesiology, University of Illinois at Urbana-Champaign, 225A Freer Hall, 906 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M.J. Adrian, R.A. Boileau, J.W. Loy, G. Lueschen, B.H. Massey, D.D. Matthews, K.M. Newell, G.C. Roberts, R.G. Wright

Associate Professors: L.G. Carlton, D.R. Gould, S.L. Greendorfer, P.N. Kugler, J.E. Misner, M. Slaughter, M. Trekell

Assistant Professors: G.W. Bell, H. Deutsch, L.L. Ji, S.S. Palmer

Graduate Degree Programs. The Department of Kinesiology offers graduate work leading to the degrees of Master of Science in the Teaching of Kinesiology, Master of Science, and Doctor of Philosophy. Major areas of specialization at both the master's degree and doctoral degree level include: (1) Biodynamics of Physical Activity—the study of work output, energy, and efficiency of movement, undertaken to better understand the nature of exercise stress, mechanics of human movement, and fitness throughout the human life span; (2) Social Science of Physical Activity—the study of antecedents and consequences of involvement in physical activity and sport as well as the impact that physical activity and sport have upon individuals, society, and culture; (3) Coordination, Control and Skill—the study of the mechanisms and processes involved in the coordination, control, and skill of human physical activity. Areas of specialization at the master's level only also include Pedagogical Kinesiology—the study of the organization and instructional concepts essential for the efficient and effective conduct of physical activity programs, particularly those that relate to physical education and sport contexts; and Therapeutic Kinesiology—the study of movement as a therapeutic vehicle for health and wellness, particularly the prevention and rehabilitation of injury or movement function.

Master of Science in the Teaching of Kinesiology. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, eligibility for teacher certification in Illinois, a minimal total score of 1500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for individuals who wish to advance their teaching competencies. Candidates for this degree must complete a minimum of 8 units, 4 of which must be in kinesiology and 2 in education courses. Three of the total units must be in 400-level courses. Of the 4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. Information concerning the specific requirements of the 2 units in education may be obtained from the graduate studies office of the department. At least one-half of the minimum units required for this degree must be in courses meeting on the Urbana-Champaign campus. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A thesis is not required.

Master of Science. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, a minimal total score of 1500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for those individuals desiring to study a particular area of interest in depth. Candidates for this degree must complete a minimum of 8 units, 4 of which must be completed in kinesiology and 2 in other disciplines. Three of the total units must comprise 400-level courses. Of the 4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appro-

priate to a student's program of study is required. At least one-half of the minimum units must be in courses meeting on the Urbana-Champaign campus. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A student may choose to write an acceptable thesis for 2 units of credit (i.e., Kinesiology 499) or select a nonthesis option by substituting 2 units of credit (i.e., approved credit that includes at least 1 unit of Kinesiology 493 (Independent Study).

Doctor of Philosophy. Admission to this degree program requires a master's degree from an accredited institution of higher education, completion of a thesis or equivalent research experience, a minimum grade-point average of 4.5 (A = 5.0) for all graduate work, a minimal total score of 1800 on aptitude portions of the Graduate Record Examination, and three letters of recommendation. Doctor of Philosophy degree candidates pursue an advanced program of study and research in preparation for careers in research and teaching. Candidates must complete 16 units of work beyond the master's degree, including 4 units in other disciplines and 8 units of thesis research. Ph.D. candidates are required to demonstrate competence in research methodology appropriate to their area of study. They must also successfully complete the preliminary and final doctoral examinations.

Research Facilities. In support of its graduate programs and research efforts, the Department of Kinesiology maintains several research facilities, including the Biomechanics Research Laboratory, and the Physical Fitness Research Laboratory.

Financial Aid. A number of teaching assistantships are available in the department's instructional programs. A limited number of research assistantships are available to support the departmental research laboratories. Assistantships normally provide a stipend for services performed, as well as a tuition and partial fee waiver.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: W. Franke
Correspondence and Information: Associate Director, Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: F.D. Blau, P. Feuille, W. Franke, P. Hartman, W. Hendricks, C. Hulin, L. Kahn, B. Karsh, G. Oldham, M. Rothbaum, K. Taira, H. Triandis
Associate Professors: F. Drasgow, J. Lawler
Assistant Professors: P. Carnevale, B. Rabin, B. Roach, P. Sherer
Professors Emeriti: M. Derber, W. Form, M. Wagner

Graduate Degree Programs. The Institute of Labor and Industrial Relations (L.I.R.) offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. Students must meet the general admission requirements of the Graduate College as well as the specific requirements of the institute.

Graduate study at the institute is based on a multidisciplinary approach to industrial relations problems and a flexible curriculum. To achieve this, the institute has joint faculty appointments and course listings with economics, psychology, sociology, and business administration; and joint course listings with law, political science, vocational education, and social work.

Master of Arts. The master's program can lead to a professional, terminal A.M. degree, or it can prepare students to continue their graduate study toward a Ph.D. degree or doctoral degrees in law and other professional areas. The fields of concentration are: unions, management, and labor relations policy; organizational behavior and personnel management; and labor markets and employment.

The institute offers a number of program options for the A.M. degree. All options require a minimum of 10 units of work and normally take three semesters to complete.

All of the master's degree programs have core requirements in industrial relations systems, quantitative methods, and research methods.

Admission to the master's program is based on an applicant's undergraduate record, letters of reference, Graduate Record Examination scores, and statement of interest and goals. Normally, the minimum requirements for admission are a course in statistics and an average grade of B in the last 60 hours of undergraduate work. A deficiency in statistics may be made up by taking the required course without graduate credit during the first semester of graduate study.

Joint J.D./A.M. The joint degree program with the College of Law leads to the J.D. and the A.M. degrees in labor and industrial relations in three and one-half years. Students must apply to both the College of Law and the Institute of Labor and Industrial Relations and must be accepted by both units.

Doctor of Philosophy. The Ph.D. program in labor and industrial relations is an interdisciplinary research degree. An individual program is built around the student's area of specialization. It includes industrial relations theory, research methodology, and course work both in a major social science discipline and in other professional and disciplinary subjects relevant to the interdisciplinary area of specialization. Examples of areas of specialization include: government employer-employee relationships; labor in politics; economic effects of collective bargaining; discrimination in employment; wage policy issues in economic development; motivation, morale, and job satisfaction; international comparative industrial relations systems; behavior in union and management organizations; interorganizational relations; work design; pay systems; cross-cultural issues in industrial relations; and structural and technological determinants of human behavior. The Ph.D. degree requires 24 units of credit beyond the baccalaureate degree, satisfactory completion of qualifying examinations in industrial relations theory and the area of specialization, and a thesis.

A student interested in earning a Ph.D. degree after receiving a master's degree at the institute should indicate this fact on the application for admission. Students with outstanding undergraduate records or with a master's degree from another institution may apply for entrance directly to the doctoral program. The degree should be in labor and industrial relations or an allied field such as business administration, economics, history, sociology, political science, or psychology. The applicant should submit with the application evidence of research competence (master's thesis, term papers, an undergraduate thesis, special reports, or published articles). All papers will be returned.

Financial Aid. The institute offers research assistantships to high-ranking graduate students and to new students whose undergraduate records are superior. Research assistants receive a salary plus exemption from tuition and some fees. The Graduate College also awards fellowships that carry stipends plus tuition and service fee waivers. Tuition and service fee waivers may also be granted but do not carry a stipend.

LANDSCAPE ARCHITECTURE

Head of the Department: V.J. Bellafiore
Coordinator of the Graduate Program: Terence G. Harkness
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 214 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: V.J. Bellafiore, T.G. Harkness, L.D. Hopkins, J.A. Jakle, W.M. Keith, R.B. Riley, E.S. Weidemann
Associate Professors: J.V. Hammond, B.A. Orland
Assistant Professors: L.A. Irvine, D.M. Johnston, G.B. Kesler, D.A. Kovacic

Graduate Degree Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture. The program is designed to enable students to gain fresh insights and to experiment with new applications pertaining to

land and its use by people. Courses and faculty research activities range from at site to regional scales and include land resources planning and design, and behavioral and cultural factors in design. The scope of work may include ecological and behavioral assessment, human perception, and comprehensive computer-based methods. Before submitting an application, students should obtain a pamphlet from the department which describes the specific areas of study and the time needed to complete the requirements.

Admission. The Graduate College admission requirements apply, except that higher TOEFL scores are required for International students. Students are admitted on an individual basis according to a review of their prior accomplishments with an emphasis on academic achievement. Candidates from undergraduate design programs must submit samples of their design work with their applications. Candidates without undergraduate preparation in landscape architecture will be admitted on limited status and must complete undergraduate prerequisite courses in addition to graduate work.

Master of Landscape Architecture. A student must complete a minimum of 12 units with at least 6 units taken within the department and at least 3 units of electives chosen from courses offered outside the department. At least 4½ units must be taken in 400-level courses. Specific courses to be taken are determined in consultation with an adviser. These courses culminate in a master's thesis (Landscape Architecture 499) that permits the student under the approval and supervision of a faculty committee to pursue independently, and in depth, a work of particular relevance for landscape architecture.

Financial Aid. Students compete for fellowships, tuition and service fee waiver, and assistantships.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center: Enrique Mayer
Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana- Champaign, 1208 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: W. Baer, C. Blaylock, P. Cole, C. Deal, R. Findley, E. Garfield, D. Grove, J. Hill, D. Lathrap, J. Love, R. Reisner, S. Schmidt, I. Schulman, R. Scott, J. Thompson, R. Troike, J. van Es, J. Warfield, N. Whitten, R. Zuidema
Associate Professors: A. Aiex, C. Augspurger, P. Borgeson, S. Brown, D. Coes, P. Garber, E. Mayer, T.Meehan, M. Palencia-Roth, M. Solaun
Assistant Professor: N. Jacobsen

Graduate Degree Programs. Graduate minors in Latin American and Caribbean Studies are administered by the Director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin American and Caribbean Studies must complete 2 units from the courses prescribed by the Center. Doctoral candidates who elect a minor in this area must complete 4 units for one minor or 2 units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center. A combined graduate program in Agricultural Economics and Foreign Area Studies (in this case, Latin American Studies) is also available.

Students in technical and professional colleges and schools of the University of Illinois at Urbana-Champaign who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the Director of the Center or with their advisers in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry

on technical or professional work in the Latin American and Caribbean area for government, private business, publishing, or religious organizations.

A high level of proficiency in one or more languages of the region (Spanish, Portuguese, Indian languages) is required. For course information, requirements and methods used to establish the level of proficiency, please contact the Center Director or Student Advisor.

Language Instruction. The Center offers Quechua, the native language spoken by 10½ million people in the Andean republics.

Financial Aid. The Center is a recipient of Federal Government Title VI Foreign Language and Area Studies (FLAS) Fellowships for Graduate Studies in any discipline which includes a minor in Latin American Studies and an intensive program of language instruction. Summer Fellowships for intensive language courses abroad or in the U.S. are available. Small travel grants for graduate students wishing to do research during the summer are also available on a competitive basis. Both these programs depend on outside funding and thus cannot be guaranteed in any given year.

LAW

Dean of the College: Peter Hay
Director of Graduate and International Legal Studies: R. Reisner
Correspondence and Information: Office of Graduate and International Legal Studies, University of Illinois at Urbana-Champaign, 105 Law Building, 504 East Pennsylvania Avenue, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: M.W. Benfield, F.A. Boyle, J.E. Cribbet, R.W. Findley, O.F. Harris, S.L. Harris, P.H. Hay, M. Hoeflich, R.L. Kaplan, H.D. Krause, W.R. LaFave, P.B. Maggs, R.L. Marcus, J.H. McCord, J.E. Nowak, R. Reisner, R.D. Rotunda, E.F. Scoles, E.W. Shoben, V.J. Stone
Associate Professors: G. Bradley, W.J. Davey, E. Freyfogle, J.E. Lopatka, L.A. Reynolds
Assistant Professors: D.A. Dripps, K. Kinports, T. Mengler, A.L. Merritt, D.J. Merritt, S. Ross, C.J. Tabb

Programs of Graduate Study. Programs of graduate study in law are designed for law graduates who wish to pursue advanced study and conduct independent research under the direction of the College of Law faculty. Three advanced degrees are conferred by the College of Law; the degree of Master of Comparative Law (M.C.L.), the degree of Master of Laws (LL.M.), and the degree of Doctor of the Science of Law (J.S.D.). Since each of these degrees differs substantially in terms of purpose and curricular requirements, admission is specific as to a particular degree program. Overall coordination of the graduate program is the responsibility of the Director of the Office of Graduate and International Studies, and individual inquiries should be addressed to this office.

Master of Comparative Law (M.C.L.). The degree of Master of Comparative Law is designed primarily for foreign lawyers or law teachers who wish to increase their knowledge of the Anglo-American common law system and engage in comparative legal research.

Candidates for the M.C.L. must complete a minimum of eight units of study in law. With the exception of one course entitled Introduction to U.S. Law, 6 units of the 8 unit requirement will consist of regular law courses to be selected from among the curricular offerings of the College of Law. (A description of these courses may be found in the section entitled "Description of Courses" in the College of Law catalog.) The remaining two units may consist of independent research or a reading course to be taken under faculty supervision.

Master of Laws (LL.M.). The Master of Laws (LL.M.) degree is open to graduates of U.S. law schools or students from other jurisdictions including civil law countries who

have completed studies leading to the basic law degree.

For students whose prior legal studies were in a common law jurisdiction, the requirements consist of 4 units of course work and 4 units of research leading to a dissertation. Candidates from common law jurisdictions must elect 4 units of course work from among the courses offered in the second- or third-year curriculum (see Description of Courses in the College of Law catalog). Upon petition, law-related courses offered by other University departments may be counted as credit toward the LL.M. degree.

Candidates whose basic law training was taken in a civil law or other non-common law jurisdiction, must complete a total of 8 units of course work including a special course "Introduction to U.S. Law." The remainder of the 8 units must be selected from any of the regular courses offered in the law school curriculum. A dissertation for those who have graduated from a non-common law jurisdiction is not required.

Doctor of the Science of Law (J.S.D.). Applicants may be considered for admission into the J.S.D. program only upon the completion of at least two semesters of graduate study in law at the University of Illinois at the master's level. Admission into the program will be based on the level of the applicant's performance in courses and research taken during the period in residence as well as his or her demonstrated ability for independent research and writing.

The requirements for the J.S.D. degree consist of the preparation of a dissertation of publishable quality and a program of study prescribed by the Committee on Graduate and International Studies. This program of study includes, as an essential element, research and writing under faculty supervision in areas related to the candidate's J.S.D. thesis. In addition, candidates will generally be required to take those courses and seminars from among the College of Law course offerings that relate to the candidate's dissertation topic. After submission of the dissertation, the candidate must pass an oral examination in defense of the dissertation before a doctoral committee of the faculty specifically convened for that purpose.

Financial Aid. The College of Law offers six instructorships to students whose backgrounds have been in the Anglo-American common law system and four research assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and service fees are available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by February 1.

LEISURE STUDIES

Head of the Department: Lawrence R. Allen

Correspondence and Information: Head, Department of Leisure Studies, University of Illinois at Urbana-Champaign, 104 Huff Gymnasium, 1206 South Fourth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: J.J. Bannon, R.J. Burdge, J.R. Kelly, G.C. Roberts

Associate Professors: L.R. Allen, L. Barnett Morris, D.J. Brademas, G.E. Chick, R.D. Espeseth, D.A. Kleiber, M.J. Manfredo, C.A. Peterson

Assistant Professors: J.D. Burnam, W.R. McKinney, J.J. Sneegas

Professors Emeriti: G.A. Lowrey, Jr., A.V. Sapora

Graduate Degree Programs. The Department of Leisure Studies offers a program of study leading to the Master of Science and the Doctor of Philosophy degrees. The Master of Science program prepares supervisors and administrators for public parks and recreation systems, treatment centers for the ill and disabled, and various private and semipublic settings providing leisure services, or the M.S. degree may serve as the first step toward the Ph.D. program. The Ph.D. program is, in general, designed to develop educators and research personnel in the study of leisure behavior, the management of leisure service delivery systems, or both.

Admission. The Graduate College admission requirements apply. The departmental graduate committee considers the candidates' maturity, experience, and commitment to the field in making admission decisions. Specifically, the admission requirements are as follows: minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed; satisfactory verbal, quantitative, and analytical Graduate Record Examination scores; 15 semester hours of behavioral science; 8 semester hours of natural science; and an acceptable introductory statistics course. The previous degree field is of importance, and preference is given to those with a solid array of undergraduate courses in recreation or, for Ph.D. applicants, a master's degree in the field. Preference is also given to applicants who will be full-time students and active degree candidates.

Master of Science. A candidate for the M.S. degree must spend at least one semester on campus and complete a minimum of 8 units, 3 of which must be in the 400 series and 2 of the 3 in leisure studies. Four of these units should be in the student's area of specialization. A thesis may be written for 2 units of credit. A full-time student can complete the program in three or four semesters.

Doctor of Philosophy. A candidate for the Ph.D. degree must spend at least two years in residence and satisfactorily complete a minimum of 16 units beyond the master's degree. These units include the credit for the Ph.D. thesis. Departmental requirements include satisfactory performance on the doctoral qualifying examination, the written preliminary examination at the completion of formal course work, the oral preliminary examination on the proposed research for the thesis, and a final examination in defense of the doctoral thesis.

Financial Aid. The department offers one-quarter-time and one-half-time assistantships in both teaching and research. If possible, students should indicate a desire for this type of part-time employment when applying for admission.

LIBRARY AND INFORMATION SCIENCE

Dean of the Graduate School of Library and Information Science: Leigh S. Estabrook
Correspondence and Information: Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, 410 David Kinley Hall, 1407 West Gregory Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M. Brichford, M.T. Choldin, C.H. Davis, L. Estabrook, K.L. Henderson, D.W. Krummel, F.W. Lancaster, M. Williams
Associate Professors: S. Richardson, M. Siegel, L. Smith, P. Stenstrom, T.L. Weech
Assistant Professors: L. Auld, L. Edmonds, D.W. Johnson, R. Molyneux, D. Shaw

Graduate Degree Programs. The Graduate School of Library and Information Science offers programs of study leading to the Master of Science, the Certificate of Advanced Study, and the Doctor of Philosophy degrees. The Master of Science degree program prepares men and women for professional careers in all types of libraries and information centers. The Certificate of Advanced Study program provides the opportunity (a) to study an aspect of library and information science in greater depth than is possible in the Master of Science program, (b) to refresh and upgrade one's professional training several years after the Master of Science program, or (c) to redirect one's career into a different area of library and information science. The Doctor of Philosophy is a research degree program.

Admission. In addition to the general admission requirements of the Graduate College, consideration is also given to language study, relevant work experience, letters of reference, Graduate Record Examination aptitude test scores, and evidence of leadership. International students must score at least 600 on the Test of English as a Foreign Language. The Certificate of Advanced Study and Doctor of Philosophy programs

require a master's degree in librarianship from a library school with an A.L.A.-accredited program and a grade-point average of at least 4.0 (A = 5.0) in the master's program. For the Doctor of Philosophy program, two years of library work experience at the professional level and an interview with the school's advanced studies committee are also required.

Master of Science. Ten units of graduate study, including 1 unit of Library and Information Science 300, a ½ unit of Library and Information Science 307, and a ½ unit of Library and Information Science 320 are required of all students. Possible areas of specialization include all main types of libraries (e.g., academic, public, school, and special), all main types of work in libraries (e.g., cataloging, reference, and children's services), plus other concentrations such as information science, library automation, rare books, and archives. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A thesis is not required but is available as an option. A minimum of twelve months is required to complete the master's program.

Certificate of Advanced Study (C.A.S.). The certificate is awarded upon the successful completion of 10 units of graduate course work beyond the master's degree. Of the 10 units, at least 6, including Library and Information Science 459 (C.A.S. Project), must be in library and information science. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A minimum of twelve months is required to complete the C.A.S. program.

Doctor of Philosophy. The program consists of three stages: (1) generalization (9 units of course work required of all doctoral students), (2) specialization (3 or more units of elective course work plus a research tool), and (3) thesis (8 or more units). Thus, a minimum of 12 units of graduate course work plus 8 units of thesis credit are required. A minimum of two years is required to complete the necessary course work; an additional year or more, preferably in residence, is required for the thesis. A 4.5 GPA is the minimum for the four required seminars.

Financial Aid. Financial aid may be available from the school, the University of Illinois Library, area libraries, and the like, in the form of graduate assistantships, preprofessional positions, and hourly paid work. Also, the school has a limited number of fellowships and tuition waivers for which doctoral students tend to be favored over C.A.S. and master's students.

Research Interests, Facilities, and Resources. Major areas of faculty research interest include bibliography, cataloging and classification, information storage and retrieval, library automation, nonprint media, library services for children and young adults, and reference tools and services. The school's Library Research Center engages in applied and pure research on contract; staff members of the Library Research Center are available to students and faculty for consultation and guidance. A minicomputer network and CD-ROM system are integral to teaching and learning activities. The University of Illinois Library provides a vast reservoir of resources for all types of study and research in library and information science.

The school maintains an ongoing commitment to continuing education through conferences, institutes, workshops, and special course offerings. Of particular note are the annual Allerton institutes and clinics on library applications of data processing. An extensive publications program includes the annual *Proceedings* of each of these, plus *Library Trends, Occasional Papers* and a variety of monographs.

LIFE SCIENCES

(Including Interdepartmental Biology Programs; Anatomical Sciences[3]; Ecology, Ethology, and Evolution; Entomology; Microbiology; Physiology and Biophysics; and Plant Biology)

Director of the School: Samuel Kaplan

Correspondence and Information: Director of the School of Life Sciences, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

Graduate Degree Programs. The School of Life Sciences includes the Departments of Anatomical Sciences[3]; Ecology, Ethology, and Evolution; Entomology; Microbiology; Physiology and Biophysics; and Plant Biology. Study programs leading to the graduate degrees of Master of Science and Doctor of Philosophy exist in each of the departments and are described in detail on the following pages. In addition, interdepartmental study programs leading to the Ph.D. degree in neural and behavioral biology, and plant physiology are administered within the school.

Financial Aid. Support for graduate training is available in the form of teaching or research assistantships and University Fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department or for interdepartmental study programs from the School of Life Sciences.

A training grant is available from the National Institutes of Health for the support of the exceptional student with interests in the molecular basis of cellular processes. Research areas include molecular genetics, cell structure and function, molecular structure, gene expression, developmental biology, cell differentiation, and virology. Candidates are selected for the grant from students already admitted to degree-granting programs in SOLS (or certain other units of the university). Students who are accepted will receive a stipend and be designated NIH predoctoral trainees. They must fulfill the requirements of the degree program into which they are accepted as well as some additional courses which constitute a core program as designated by the grant. Other grant-sponsored activities include a seminar series and research presentations.

Interdepartmental Biology Programs

Director of Biology Programs: M.E. Reichmann
Correspondence and Information: Biology Programs, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

Graduate Degree Programs, Admission. Interdepartmental biology programs lead to the Ph.D. in neural and behavioral biology and plant physiology. Additionally, two master's programs (M.S. in Biology, and M.S. in the Teaching of Biological Sciences and General Science) are offered. Graduate Record Examination scores are required for all Ph.D. programs and for the M.S. in the Teaching of Biological Sciences and General Science. All applicants must also outline their educational objectives in a brief statement and submit three letters of recommendation.

Master of Science in the Teaching of Biological Sciences and General Science. This degree is intended for persons planning to enter the teaching profession or who presently are teaching biology or general science in junior high school, high school, or junior college. It is awarded upon the completion of a minimum of 8 units of advanced credit (outlined below) and certification. For admission to this program, students must have an admission average of at least 4.0 (A = 5.0), and Graduate Record Examination scores must be submitted.

Candidates for the Master of Science in the Teaching of Biological Sciences and General Science must earn 4 units in biological sciences, 2 units in education (see page 86), and 2 units in electives. Electives may be in the biological sciences, education, or, in exceptional cases, other fields. A course in biological chemistry is strongly advised. Students who are preparing for high school teaching and who are not yet certified must fulfill state certification requirements.

Master of Science in Biology. This program is designed by the student in consultation with an appropriate adviser. While general training in biology is encouraged, concentration in any area of biology is possible as well; however, students intending to concentrate in anatomical sciences[3], entomology, microbiology, animal physiology, biophysics, or plant biology should apply directly to the appropriate School of Life Sciences departmental graduate program. Admission requires a grade-point average of at least 4.0. Although no specific undergraduate courses are required for admission to this curriculum, a minimum of a year of physics with laboratory, a course in organic chemistry with laboratory, and a semester of calculus must be completed before a degree is granted.

In order to preserve an active status in this program, the student must be registered in at least two graduate-level biology courses per semester and maintain a grade-point average of at least 4.0. Of the 8 units required for the degree, at least 3 units must be taken in 400-level courses. A comprehensive examination may be required of all candidates.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in the following interdepartmental areas: neural and behavioral biology, and plant physiology. Entrance requirements, in addition to those listed for the Master of Science degree, include background training in general biology, physics, biochemistry, and calculus; deficiencies in these areas may be remedied during the first year of graduate study. Programs are designed in consultation with advisers to suit individual needs. Students who have been accepted for one of these programs may select as a major adviser a faculty member from any department in the School of Life Sciences or an appropriate member of a cooperating department. Additional information may be obtained from the School of Life Sciences. Descriptions of these area doctoral programs are given below.

Anatomical Sciences[3]*:* See below.

Ecology, Ethology, and Evolution. See page 122.

Neural and Behavioral Biology. This multidisciplinary program includes staff members from physiology; psychology; biochemistry; biophysics; anatomical sciences,[3] entomology; ecology, ethology, and evolution; engineering; veterinary medicine; and basic medical sciences. The program is heavily research oriented with individually tailored plans of study designed to provide students with a strong background in the collective disciplines of neurobiology and in the students' specific areas of concentration. Research areas include neuroanatomy, neurochemistry, neuroendocrinology, neurobiological development and genetics, neural-physiology, membrane biophysics, neutroethology, and physiological psychology.

Plant Physiology. Plant physiology, an interdepartmental area of specialization, is staffed by plant physiologists from six plant science departments; agronomy, forestry, horticulture, physiology and biophysics, plant biology, and plant pathology. Thesis research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen metabolism, hormones and nucleic acids, herbicide action, molecular biology of chloroplasts, water relations, environmental physiology, and disease physiology. In addition to plant physiology, students are required to complete courses in biochemistry and physical chemistry.

Anatomical Sciences[3]

Head of Department: A.F. Horwitz

Correspondence and Information: Department of Anatomical Sciences,[3] University of Illinois at Urbana-Champaign, 506 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L. Barr, W.T. Greenough, A.F. Horwitz, C.C.C. O'Morchoe, P.J. O'Morchoe, D.M. Steffensen, D.L. Stocum

Associate Professors: J.A. Cameron, W.L. Daniel, M.A. Holzwarth, S.J. Kaufman, L.L. Klepinger, A. Kokko-Cunningham, J.E. Mittenthal, J.A. Weyhenmeyer

Assistant Professors: J.A. Kaput, J.M. Thompson

Graduate Degree Program. The Department of Anatomical Sciences[3] administers a graduate degree program as an option in biology. Departmental faculty are concerned with the structural and functional relationships of cells and organisms with research emphases upon animal cell and molecular biology, neurobiology, structural biology, and developmental biology.

[3]At the time of printing, a proposal was pending final approval to change the name to Department of Cell and Structural Biology.

Admission. Applications are evaluated on an individual basis. The formal entrance requirement is a minimum grade-point average of 4.0 (A = 5.0). Important factors in the evaluation of applications are general academic performance, background in the biological and chemical sciences and mathematics, graduate record examination scores, and letters of recommendation from college professors. Although applications from qualified students are considered throughout the year, deadline for submission of applications for fall semester is February 15.

Doctor of Philosophy in Biology: Anatomical Sciences Area of Specialization.[4] The program leads to the Doctor of Philosophy degree. In order to successfully complete the graduate program in anatomical sciences,[4] the student must fulfill requirements in the following categories: course work, qualifying examination, preliminary oral examination, defense of the thesis, teaching, and departmental seminars. A brochure providing additional information about the program is available upon request.

Financial Aid. Financial aid is available to a limited number of qualified applicants in the form of: 1) University Fellowships and tuition and fee waivers, awarded on a competitive basis; 2) teaching assistantships awarded by the department; and 3) research assistantships, allotted by individual faculty members with research funds available for this purpose. Exceptional students will qualify for support from the Cell and Molecular Biology Training Program. Financial packages can be assembled from two or more of the above sources for qualified candidates.

Ecology, Ethology, and Evolution

Head of the Department: G.O. Batzli

Correspondence and Information: Department of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign, 515 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G.O. Batzli, R.W. Burkhardt, T.H. Frazzetta, L.L. Getz, A.W. Ghent, J. Hirsch, L.R. Maxson, D.L. Nanney, L.M. Page, D.P. Philipp, S.L. Portnoy, M. Salmon, G.C. Sanderson, G.S. Whitt, M.F. Willson, C.R. Woese

Associate Professors: N. Burley, E.E. Herricks, G.H. Kieffer, R.P. Larkin, M.R. Lee, M.R. Lynch, P.E. Ross, D.C. Sweeney, T. Uzzell, S. Yokoyama

Assistant Professor: S.K. Robinson

Graduate Degree Programs. The Department of Ecology, Ethology, and Evolution administers graduate degree programs as options in biology. Areas of training include physiological, population, community, and evolutionary ecology; ethology, physiological mechanisms of behavior, and behavior-genetics; evolutionary biology, population genetics, karyotypic and molecular analysis, functional anatomy, and systematics; quantitative analysis of genetic and ecological systems; and resource management.

Admission. Acceptance for graduate study in ecology, ethology, and evolution is based on the applicant's research potential and academic achievement. An undergraduate degree in the life sciences is the usual preparation, but students majoring in mathematics, computer science, or the physical and social sciences are also considered. Courses required for admission are inorganic and organic chemistry, biochemistry, a year of physics, and mathematics through calculus. Students lacking one or more of these courses may be admitted with the provision that such deficiencies be completed in addition to the normal graduate course load. A grade-point average of at least 4.0 (A = 5.0) for the last 60 hours of undergraduate work in addition to any graduate study is mandatory, and good scores on the Graduate Record Examination are necessary. Considerable emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

[4]The Department of Anatomical Sciences (to be renamed Department of Cell and Structural Biology) is proposing a new specialization in Cell and Structural Biology.

Master of Science. With approval of the M.S. biology committee, students in ecology, ethology, and evolution may pursue an M.S. degree in biology under the supervision of a departmental adviser (see Master of Science in Biology, page 120).

Doctor of Philosophy in Biology: Ecology, Ethology, and Evolution Area of Specialization. Candidates for the Ph.D. degree must demonstrate excellence by examination and, in consultation with an adviser and doctoral committee, plan and carry out original thesis research with distinction. A qualifying examination covering general knowledge is given in the second year of the student's program, and a preliminary examination assessing the feasibility and significance of the thesis research is given three semesters later. Courses in both statistics and computer science are required and proficiency in one or more foreign languages may be required, depending on the field of research. Additional requirements may be prescribed by the adviser and doctoral committee. A final examination, in which the student defends the thesis, and a presentation of the thesis at a departmental seminar complete the program.

Entomology

Head of the Department: Stanley Friedman
Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: S. Friedman, A.W. Ghent, W.R. Horsfall, M. Kogan, W.E. LaBerge, J.R. Larsen, R.L. Metcalf, D.S. Seigler, R.B. Selander, J.G. Sternburg, G.P. Waldbauer, J.H. Willis
Associate Professors: M.R. Berenbaum, S. Berlocher, F. Delcomyn, M.E. Irwin, E.G. MacLeod, J.V. Maddox, W.G. Ruesink
Assistant Professor: H.M. Robertson

Graduate Degree Programs. The Department of Entomology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees.

Admission. The Graduate College admission requirements apply. Previous training in entomology is not necessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Master of Science. A candidate for the M.S. degree is expected to become knowledgeable in entomology through course and field work and to complete a research thesis in an area of interest arrived at in consultation with an adviser. The grade-point average required for degree certification is 4.0 (A = 5.0).

Doctor of Philosophy. A candidate for the Ph.D. degree must master the general areas of entomology (control, ecology, genetics, morphology, physiology, and taxonomy) and demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research, ordinarily German or Russian, is also required. The grade-point average required for degree certification is 4.0.

Financial Aid. Awards for graduate students are available, including teaching and research assistantships. In addition, various types of fellowships, traineeships, and tuition and service fee waivers are offered by the Graduate College and the School of Life Sciences. A single application to the department is sufficient for consideration for all awards currently available.

Genetics and Development

This program will be discontinued. Students in the program as of fall 1987 may continue, but students will not be admitted to the program after fall 1987. Students interested

in genetics and development should consult the Life Sciences Office (393 Morrill Hall) for advice on which program would be most appropriate to their individual interests. Study in genetics continues to be available through the various departments in the life sciences.

Microbiology

Head of the Department: Jordan Konisky
Correspondence and Information: Department of Microbiology, University of Illinois at Urbana-Champaign, 131 Burrill Hall, 407 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: M.P. Bryant, J.E. Cronan, S. Kaplan, J. Konisky, R.C. Meyer, M.J. Plewa, M.E. Reichmann, D.C. Savage, R.W. Tuveson, E.W. Voss, C.R. Woese, R.S. Wolfe
Associate Professors: J.F. Gardner, S.J. Kaufman, A.A. Salyers
Assistant Professors: V.A. Bankaitis, C.E. Bulawa, S.R. Maloy, D.A. Stahl

Graduate Degree Programs. The department of Microbiology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. For both degrees, the program provides a strong basic background in microbiology, biochemistry, cell biology, molecular genetics, and molecular biology. Students completing the program are qualified for positions in academic, industrial, or government laboratories and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Major areas of research interest are: gene expression and regulation in prokaryotes and eukaryotes, photosynthesis, viral function and development including virus host-cell interactions, membrane biogenesis including protein insertion, fatty acid, and phospholipid synthesis, bacterial pathogenesis and bacterial-host interactions, immunoglobulin chemistry, structure and expression, anaerobic microbiology, the biochemistry of methane formation and microbial physiology, the cell biology and biochemistry of development and differentiation of muscle tissue and photosynthetic organelles, yeast cell and molecular biology, prokaryote phylogeny and evolution, and archaebacteria.

Admission. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through organic chemistry and biochemistry, 15 credit hours of physical or biological sciences, and mathematics through calculus.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees, following their choice of a faculty mentor. Study programs are flexible and are dependent upon the experience, interests, and goals of each student. Experience in teaching is considered to be a vital part of the graduate program and is required as a part of the academic work of all M.S. and Ph.D. degree candidates in this department.

Physiology and Biophysics

Head of the Department: D.E. Buetow
Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, 407 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.M. Bahr, L. Barr, P.J. Bechtel, D.E. Buetow, A.R. Crofts, P.B. Debrunner, A.L. DeVries, E. Donchin, H.S. Ducoff, F. Dunn, T.G. Ebrey, H. Frauenfelder, R.B. Gennis, Govindjee, W.T. Greenough, J.E. Heath, S.L. Helman, G.L. Jackson, B.S. Katzenellenbogen, B.W. Kemper, J.R. Larsen, R.A. Nelson, C.L. Prosser, V.D.

Ramirez, E. Satinoff, D.D. Sherwood, I.A. Siegel, W.W. Sleator, H.M. Swartz, A.R. Twardock, G. Weber, J.S. Willis, C.A. Wraight, J.E. Zehr

Associate Professors: P.M. Best, M.J. Dawson, F. Delcomyn, A.S. Feng, R. Gillette, E. Gratton, M. Holzwarth, E.G. Jakobsson, A. Kokko-Cunningham, B. Oakley, E.J. Roy, D.C. Sweeney

Assistant Professors: E. Meisami, S.S. Palmer, G.N. Phillips, T.G. Waldrop

PHYSIOLOGY

Admission and Financial Aid. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a strong undergraduate training in science. The Graduate College admission requirements apply. Most students admitted have had a grade-point average between an A and B and letters of recommendation that indicate ability to perform graduate work. Fellowships and teaching or research assistantships are available for qualified students. Applicants are strongly urged to submit scores of the Graduate Record Examination (GRE) or similar examinations.

Master of Science. A master's degree requires 8 or more units of graduate work drawn from the offerings of this and other departments. Each student must submit, and pass an oral examination on, a report based on original research. The examination is conducted by a faculty qualifying committee.

Doctor of Philosophy. Every candidate for the Ph.D. degree is required to take three core lecture courses and four laboratory courses, the latter of 5 weeks duration each, in order to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology. Each student also is expected to acquire a high degree of expertise in an area of specialization; to develop proficiency in biochemistry, physical chemistry, and statistics; and have a reading knowledge of one foreign language (usually French or German). The student should begin research as soon as possible after admission. To qualify to continue in the Ph.D. program, students must submit, and pass an oral examination on, a report describing their initial research. The examination is conducted by a faculty qualifying committee usually during the fourth semester after admission to the graduate program.

The preliminary examination is taken after completion of at least 16 units of graduate course work, after completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. Defense of a thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the branches of physiology constitutes the final examination.

BIOPHYSICS

Admission and Financial Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical sciences to the solution of biological problems. The curriculum is broadly based, and provides an adaptable approach for students entering with previous training in the physical sciences or for students with a background in biology and some experience in the physical sciences. Admission requirements are normally one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through calculus, but deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0 (A = 5.0). Fellowship, traineeships, and teaching or research assistantships are available for qualified students. Normally students are expected to gain at least one semester of teaching experience during their graduate careers.

Master of Science. To obtain the Master of Science degree, the student must complete at least 8 units in biophysics and related subjects, including 3 units at the 400-level, of which 2 units must be in biophysics courses (excluding individual topic courses, seminars, and research). A thesis or research paper in a specialized field is also required.

Doctor of Philosophy. A flexible approach is made to curriculum requirements, but an acceptable course program usually includes the following: (1) Physical sciences: mathematics through differential equations, physics and physical chemistry including

thermodynamics and elementary quantum mechanics, and biochemistry with laboratory. (2) Biophysics: satisfactory completion of 3½ units of 400-level biophysics courses (excluding individual topic courses, seminars, and research). Other subjects may be taken with the approval of faculty. (3) Students are encouraged to gain research experience as soon as practicable after admission; the Ph.D. degree is a research degree, and the program is designed with a major emphasis on individual research.

A pass-fail qualifying examination is usually taken during or before the fourth semester. After the student has formulated a definite research problem, he takes the preliminary examination in which this topic is presented to a faculty committee. The committee also will question the candidate on his general research area. Finally, a thesis based on original work and demonstrating a thorough knowledge of theory and techniques in one of the areas of biophysics must be defended at the final examination.

Plant Biology

Head of the Department: Tom L. Phillips

Correspondence and Information: Associate Head, Department of Plant Biology, University of Illinois at Urbana-Champaign, 289 Morrill Hall, 505 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.E. Buetow, Z.B. Carothers, R.E. Crang, D.B. Dickinson, Govindjee, C.H. Grunwald, L.R. Hoffman, J.R. Laughnan, W.L. Ogren, D.R. Ort, T.L. Phillips, D.S. Seigler, R.W. Tuveson, C.A. Wraight

Associate Professors: C.K. Augspurger, J.M. Cheeseman, M.L. Sargent, C.A. Shearer, C.J. Whitmarsh

Assistant Professors: E.H. DeLucia, T.W. Jacobs, A.G. Jones, D.L. Nickrent, E.M. Orozco, M.A. Schuler, R.E. Zielinski

Affiliates: L.I. Nevling, J.A.D. Parrish, K.R. Robertson

Adjunct Professor: F.A. Bazzaz

Graduate Degree Programs. The Department of Plant Biology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. It also participates in interdepartmental study programs leading to doctoral degrees in plant physiology.

Areas of specialization available within the department include: anatomy, bioenergetics, biophysics, bryology, circadian rhythms, development, ecology, genetics/molecular biology, mycology, paleobotany, paleoecology, photosynthesis, phycology, physiology, phytochemistry, population biology, systematics, and ultrastructure. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization. A knowledge of the principles of ecology, genetics/molecular biology, morphology, physiology, and systematics is strongly recommended.

A brochure providing additional information about the department, its facilities, and the research interests of its faculty is available from the associate head upon request.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required. Graduate College admission requirements also apply.

Master of Science. Candidates for the M.S. degree are expected to fulfill the requirements of the Graduate College and to broaden and deepen their training in a program of course work and research agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser. The master's degree program is normally completed within two years.

Doctor of Philosophy. Candidates for the Ph.D. are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

An evaluation of each student's academic progress will be made at the end of his or her second year of graduate study, and departmental approval must be obtained at this juncture to continue in a graduate degree program.

An evaluation of each student's academic progress will be made at the end of his or her second year of graduate study, and departmental approval must be obtained at this juncture in order to continue in a graduate degree program.

Financial Aid. Teaching assistantships, fellowships, and research assistantships are available for qualified students. A student who is awarded a fellowship may apply to have his or her stipend augmented with a part-time teaching or research assistantship.

Outstanding Facilities. Outstanding teaching and research laboratories encompass both molecular and organismal plant biology and are complemented by growth-chamber facilities, environmentally controlled greenhouses, an excellent herbarium and paleobotanical center for collections.

LINGUISTICS

(Including Arabic, Modern and Classical Hebrew, Hindi, Persian, Sanskrit and African Languages)

Chairperson of the Department: Charles W. Kisseberth

Correspondence and Information: Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, D.E. Baron, W.C. Blaylock, G.M. Brown, C.C. Cheng, P. Cole, C.L. Dawson, P.A. Gaeng, G.M. Greene, H.H. Hock, B.B. Kachru, Y. Kachru, M.J. Kenstowicz, C.-W. Kim, C.W. Kisseberth, C. Kramarae, F.K. Lehman, H. Maclay, S. Makino, J.W. Marchand, E. Newport, M. Saville- Troike, G.L. Tikku, R.C. Troike, L. Zgusta

Associate Professors: E.G. Bokamba, L.F. Bouton, J.R. Cowan, W.B. Dickerson, R. Dunatov, F.Y. Gladney, F.M. Jenkins, J.L. Morgan, D. Wanner

Assistant Professors: N. Besnier, E. Hinrichs, M. Mack, R. Pandharipande

Professors Emeriti: K.O. Aston, H.R. Kahane

Graduate Degree Programs. The department of Linguistics offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees. Work toward these degrees is divided into three areas. General linguistics includes historical linguistics, phonology, semantics, and syntax. Applied linguistics covers artificial intelligence, cognitive science, computational linguistics, experimental phonetics, language acquisition, lexicography, psycholinguistics, sociolinguistics, and stylistics. Area linguistics may be undertaken with a concentration, for example, in African, Romance, Semitic, and South, West, or East Asian linguistics.

Admission. Undergraduate preparation for admission to the master's program in linguistics should include the equivalent of Linguistics 300, 301, and 302; at least three years of foreign language experience (familiarity with two foreign languages is recommended); and a broad background in the humanities, social sciences, and mathematics. The Graduate College admission requirements apply.

Master of Arts in General or Applied Linguistics. The aim of the master's program is to instruct students in the important areas of linguistics and the methods of linguistic analysis. Candidates for this degree must earn 8 units, including courses in syntax, phonology, history of linguistics, and an area of specialization. Those concentrating on the general program are required to take Linguistics 340, 401, 402, 411, 441, and 442. The applied program requires Linguistics 305, 325, 340, 350, 401 and 402. In addition, the student must have proficiency in one language (other than his or her native tongue) in which there exists a significant body of linguistic literature and must pass the comprehensive qualifying examination. Admission to this examination is contingent upon

satisfying the language requirement. For a terminal master's degree without the qualifying examination, a master's essay must be written in addition to the 8 units.

Doctor of Philosophy in General or Applied Linguistics. Admission to candidacy for the Ph.D. normally requires a grade-point average of 4.5 or better for all graduate work in linguistics and distinction in passing the comprehensive qualifying examination. In deciding whether a student will be admitted to the Ph.D. program, the examination and student evaluation committee takes into consideration the student's overall performance in the department, potential for linguistic research and performance on the qualifying examination.

Candidates for this degree must complete at least 24 units of graduate work or 16 units beyond the master's degree. The minimum 24 units must include the course requirements listed above for the master's degree (or their equivalent), advanced courses as required for the area of specialization, and 8 units of thesis research. Candidates must also demonstrate proficiency in a second language other than English. However, this second language requirement is made flexible, depending on the research interest of the student. The candidate is required to take the preliminary examinations (written and oral) after completion of 8 units beyond the master's level. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to 2 units of credit granted by the host university under this program may be transferred. Students of descriptive linguistics also are urged to establish a vested interest and a firm basic foundation in some particular language family as early as possible in their graduate career. Linguistically oriented courses in related departments may be counted toward the major if approved by the adviser. The head of the department acts as general adviser to each student until the selection of the field of concentration, at which time the student comes under the guidance of an adviser in his or her special area.

MATERIALS SCIENCE

The Materials Research Laboratory supports research and training of graduate students in the materials sciences. However, the laboratory is not itself a degree-granting unit. A student interested in study in materials science should apply directly to one of the departments that cooperates in research at the laboratory. These are the Departments of Chemical Engineering, Chemistry, Electrical and Computer Engineering, Geology, Materials Science and Engineering, and Physics.

MATHEMATICS

Head of the Department: Heini Halberstam
Director of Graduate Studies: Wilson Zaring
Correspondence and Information: Director of Graduate Studies, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, 1409 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: F.R. Albrecht, J.R. Alexander, Jr., K.I. Appel, R.B. Ash, S.B. Bank, R.G. Bartle, P.T. Bateman, H.E. Benzinger, Jr., I.D. Berg, E.R. Berkson, B.C. Berndt, R.L. Bishop, J. Bourgain, P.G. Braunfeld, D.L. Burkholder, R.W. Carroll, R.F. Craggs, E.C. Dade, J.P. D'Angelo, H.G. Diamond, E.G. Evans, Jr., R.M. Fossum, G.K. Francis, C.W. Gear, S.I. Goldberg, J.W. Gray, P.A. Griffith, W.J. Haboush, W.R.G. Haken, H. Halberstam, M.E. Hamstrom, S.P. Han, L.L. Helms, C.W. Henson, G.J.Janusz, R.P. Jerrard, C.G. Jockusch, F.W. Kamber, R.P. Kaufman, F.B. Knight, R.G. Langebartel, P.A. Loeb, H.P. Lotz, L.R. McCulloh, L. McLinden, J.B. Miles, D.E. Muller, H.A. Osborn, J.I. Palmore, B. Parshall, N.T. Peck, A.L. Peressini, W.V. Philipp, H.A. Porta, R.R. Rao, D.J.S. Robinson, J.J. Rotman, L.A. Rubel, P.E. Schupp, K.B. Stolarsky, W.F. Stout, M. Suzuki, G. Takeuti, T.W. Ting, P.M. Tondeur, J.J. Uhl, Jr., S.V. Ullom, J.H. Walter, P.M. Weichsel, J.E. Wetzel, S. Wolfram, J.M. Wu

Associate Professors: S.B. Alexander, P. Aviles, A. Babakhanian, J.W. Brown, L.L. Dornhoff, D.R. Grayson, D. Monrad, R.G. Muncaster, E.G. Portnoy, B.A. Reznick, Y. Saad, D.R. Sherbert, L. Van Den Dries, E.C. Weinberg, D.B. West, W.M. Zaring
Assistant Professors: S. Dutta, A. Hildebrand, P.K. Newton, M. Nicolau, J. Ramanathan, Z. Ruan

Graduate Degree Programs. The department offers graduate study leading to the Master of Science (or of Arts) and the Doctor of Philosophy in Mathematics, the Master of Science in Applied Mathematics, and the Master of Science in the Teaching of Mathematics. An advanced certificate in community college mathematics teaching is also available.

Admission. The Graduate College admission requirements apply. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics. Students whose undergraduate training in mathematics is deficient may be admitted with deficiencies to be removed during the first year of graduate study.

Master's Degree Program. The master's degree programs can be completed in one year of full-time study by students entering without deficiencies. However, most students find it necessary to devote at least one additional summer or semester. Students entering with deficiencies may require up to two years to complete the degree. There are no thesis or language requirements, and no comprehensive examination is required.

The master's degree in mathematics requires a total of 8 units of study, of which 3 must be at the 400-level, and 2 of the 3 must be in mathematics. The master's degree in applied mathematics requires a total of 8 units of study of which 3 must be at the 400-level. Additional course and sequence requirements can be satisfied through study in one of three different programs: (1) the mathematics of computation, optimization, and operations research program, (2) the science applications program, or (3) the actuarial science program.

The master's in the teaching of mathematics requires a total of 8 units of study, of which 4 must be in mathematics and 2 must be in education.

The advanced certificate in community college mathematics teaching is designed to be completed in two semesters following completion of a master's degree in mathematics. The program involves student teaching and specialized course work.

Doctoral Degree Program. Students working toward a doctoral degree usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses in abstract and linear algebra and real and complex analysis), pass the preliminary examination (testing the content of three areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. A reading knowledge of two of the following languages is required: German, French, or Russian. Students whose native language is not English may count English as a foreign language. They are then required to establish a reading knowledge of one language from German, French, or Russian, excluding their native language.

Financial Aid. Financial aid is available in the form of teaching assistantships, fellowships, and tuition and service fee waivers. The deadline for submission of complete fellowship applications is February 15. The initial deadline for submission of complete assistantship applications is also February 15, but applications are considered after that as long as positions remain available.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: A.L. Addy
Associate Heads of the Department: A.M. Clausing and R.E. DeVor
Graduate Policy Committee Chairpersons: J.E. Peters and C.L. Tucker
Correspondence and Information: Mrs. Celia G. Snyder, Graduate Programs Coordinator, Department of Mechanical and Industrial Engineering, University of Illinois at

Urbana-Champaign, 140 Mechanical Engineering Building, 1206 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A.L. Addy, R.O. Buckius, B.T. Chao, J.C. Chato, M.M. Chen, W.L. Chow, A.M. Clausing, T.F. Conry, J.M. Crowley, C. Cusano, R.E. DeVor, J.E. Greene, B.G. Jones, K. Kim, H.H. Korst, H. Krier, F.A. Leckie, J.S. Liebman, C.O. Pederson, D.F. Socie, S.L. Soo, W.F. Stoecker, J.J. Stukel, R.A. White, C.D. Wickens

Associate Professors: R.A. Beddini, C.W. Bullard, J.A. Dantzig, M.I. Dessouky, W.E. Dunn, J.C. Dutton, S.G. Kapoor, R.E. Klein, C.S. Larson, D.L. Marriott, J. Mazumder, N.R. Miller, T.A. Newell, D.H. Offner, J.E. Peters, R.E. Reid, L.D. Savage, H. Sehitoglu, C.L. Tucker

Assistant Professors: D.N. Assanis, J. Bentsman, M.Q. Brewster, R.R. Crawford, P.M. Ferreira, J.M. Flach, K. Komvopoulos, A.F. Kramer, S. C-Y. Lu, U.S. Palekar, J.P. Renie, P.M. Sanderson, B.G. Thomas, N.S. Vlachos, H.A. Zaki

Graduate Degree Programs. The Department of Mechanical and Industrial Engineering offers studies leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, and the Doctor of Philosophy in Mechanical Engineering. In mechanical engineering, a student may specialize in any of the core areas including thermodynamics, heat transfer, fluid dynamics, multiphase systems, combustion, internal combustion engines, thermal systems including environmental control in buildings, environmental engineering and air pollution controls, solar energy, kinematics and dynamics of machinery, friction, lubrication and wear, control systems, computer-aided design, application of knowledge-based expert systems, materials engineering and mechanical behavior of materials, materials processing including solidification, polymer processing and laser materials processing, and bioengineering. In industrial engineering a student may specialize in any of the several areas of manufacturing systems, operations research, and human factors, including production control and quality control, man-machine systems, facilities planning and design, computer-aided manufacturing, mathematical programming, simulation, project management, and production process design.

Admission. The requirements governing admission are as follows. The applicant must: (1) be a graduate of an institution awarding a baccalaureate degree equivalent to that granted by the University of Illinois at Urbana-Champaign; (2) be adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record; and (3) be recommended for admission by the Department of Mechanical and Industrial Engineering. A minimum grade-point average of 4.25 (A = 5.0) for the last 60 hours of undergraduate study is required. On rare occasions, the department may recommend an applicant for admission with limited standing even if the admission grade-point average is below the required departmental minimum. The department does not require the Graduate Record Examination, nor does it have a language requirement. Based upon the previous preparation of the student, prerequisite courses may be specified by the adviser, but the credit may not be applied toward a degree. The department requires a minimum TOEFL score of 590.

Master of Science. A total of 8 units (including no more than two units of thesis credit) is required. For those students terminating their studies with the M.S. degree, a nonthesis option is available by departmental petition. Those not writing a thesis are required to complete a minimum of 9 units of credit. In such cases, the study program includes a unit of laboratory investigation since each student is required to show evidence of ability to do independent study.

Doctor of Philosophy. A master's thesis or equivalent is required of all applicants for Ph.D. study. Those students who enter with a master's degree and who have not written a thesis or the equivalent may be required to register in laboratory investigations during their first semester of residence on the Urbana-Champaign campus for the purpose of demonstrating their ability to do independent research. Qualifying examinations are

to be taken during the semester in which the ninth unit of graduate credit is earned, at the earliest, but no later than the first semester thereafter. A total of 14 units of course work beyond the B.S. degree is a minimum course requirement for the Ph.D. degree. The minimum total requirement for the Ph.D. degree is 24 units, including thesis research credit. In order to be considered for acceptance as a doctoral candidate, the student must prepare a thesis proposal and take an oral preliminary examination. If successful, the candidate completes the thesis work and takes a final oral examination.

MEDICAL SCHOLARS PROGRAM

The Medical Scholars Program at the Urbana-Champaign campus enables students to combine the study of medicine with graduate or professional study in a second field. The program seeks to produce leaders in medicine and medical research uniquely qualified and motivated to address the compelling problems of health care and medical practice. The College of Medicine at Urbana-Champaign, one of four regional campuses of the University of Illinois College of Medicine, offers the program in cooperation with graduate departments and professional schools on the Urbana-Champaign campus.

Students are expected to earn two degrees—the M.D. and a graduate or professional degree. Applicants should be able to identify research interests and professional goals that demand the integration of medicine with a second field and that cannot be accomplished with one degree alone. To enter the Medical Scholars Program, applicants must meet the admissions requirements of, and be accepted by, both the University of Illinois College of Medicine and the Urbana-Champaign campus academic unit in which they wish to study. They apply to the Medical Scholars Program at the same time that they apply to medical school.

Students in the Medical Scholars Program are expected to fulfill all the requirements of both the College of Medicine and the second discipline. Faculty advisers from the medical school and from the appropriate Urbana-Champaign campus unit help students set up realistic long-term study plans which integrate the two fields.

At present, research-oriented programs of integrated study are available or being developed in the following academic units on the Urbana-Champaign campus:

Accountancy
Anatomical Sciences
Anthropology
Architecture
Biochemistry
Business Administration
Ceramic Engineering
Chemistry
Communications Research
Computer Science
Economics
Education
Electrical and Computer Engineering
Environmental Toxicology
Food Science
Health and Safety Studies
History
Kinesiology
Law
Metallurgy and Mining Engineering
Microbiology
Neural and Behavioral Biology
Nuclear Engineering
Nutritional Sciences
Philosophy
Physics
Physiology and Biophysics
Political Science
Psychology
Social Work
Sociology
Speech and Hearing Science
Speech Communication
Veterinary Biosciences
Veterinary Pathobiology

Arrangements with graduate units not listed here may be worked out, wherever possible, upon request.

In addition to the Medical College Admissions Test (MCAT), required for admission to medical school, examination scores, such as GRE, GMAT, and LSAT, are required by some departments and professional schools; applicants must arrange to take such examinations and have the scores forwarded to the appropriate academic unit on the Urbana-Champaign campus as well as to the Medical Scholars Program Office.

For further information, consult the Coordinator, Medical Scholars Program, College of Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

METALLURGY AND MINING ENGINEERING

Acting Head of the Department: D.A. Payne
Correspondence and Information: Head of the Department, Department of Metallurgy and Mining Engineering, University of Illinois at Urbana-Champaign, 201 Metallurgy and Mining Building, 1304 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.J. Altstetter, R.P. Averback, H.K. Birnbaum, H. Chen, G. Ehrlich, H. Fraser, R.J. Gaylord, P.H. Geil, J.E. Greene, F.V. Lawrence, T.J. Rowland, J. Thornton, C.M. Wayman, C.A. Wert, R.P. Wool
Associate Professors: J.M. Rigsbee, A. Zangvil
Assistant Professors: T.A. Parthsarathy, I. Robertson
Professors Emeriti: P.A. Beck, R.W. Bohl, A.J. deWitte

Graduate Degree Programs. The Department of Metallurgy and Mining Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Metallurgical Engineering. The faculty members have a widely varied background in engineering and science, and graduates go into a broad range of industrial, governmental, and university positions. Close association exists with staff members in other departments having programs in the properties of solids. Graduate courses and thesis work in polymers are available at both the M.S. and Ph.D. levels.

Admission. Graduate students in metallurgical or mining engineering may have undergraduate degrees in a number of disciplines. Graduates with degrees in metallurgy or mining engineering, as well as the many graduate students who come from other engineering or science disciplines, fit into the graduate programs easily. Graduates of departments of mechanical engineering, physics, chemistry, and ceramics are represented among our student body.

Master of Science. A candidate for the Master of Science degree is required to have a minimum of 8 units of graduate work, including a thesis. If a petition to waive the thesis is granted, a minimum of 9 units of graduate work is required. A thesis is required of candidates who hold research assistantships.

Doctor of Philosophy. Students desiring to work for the Doctor of Philosophy degree are required to pass the departmental qualifying examination. This oral examination must be taken no later than the end of the first semester after receiving the Master of Science degree from this department or after completing an equivalent amount of graduate work. The minor requirement of the department for the Doctor of Philosophy degree may be satisfied by taking courses in fields such as ceramics, chemistry, geology, mathematics, theoretical and applied mechanics, nuclear engineering, and physics. Although reading knowledge of a foreign language is helpful, there is no formal requirement.

MUSIC

(Including Music Education and Musicology)

Director of the School: Austin J. McDowell
Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, 2136 Music Building, 1114 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: H. Brun, R. Colwell, E. Dalheim, K. Drake, B. Edlefsen, T. Fredrickson, R. Gray, L. Gushee, J. Hamilton, R. Hedlund, W. Heiles, J. Hill, I. Hobson, J. Keene, H. Kellman, J. Lyke, S. Martirano, J. Melby, B. Nettl, G. Perich, D. Peters, M. Powell, A. Ringer, J. Shapiro, T. Siwe, N. Temperley, R. Thomas, P. Vermel, W. Warfield, T. Wisniewski, M. Zimmerman, P. Zonn

Associate Professors: C. Alwes, J. Beauchamp, C. Capwell, H. Klug, D. Kohut, S. Tipei, H. von Gunden, T. Ward, S. Wyatt
Assistant Professors: D. Grayson, M. Tunnell

Graduate Degree Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education. Complete details of these programs may be found in the school's brochure on graduate study in music.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the M.Mus. degree are musicology, music theory, composition, performance and literature (piano, organ, voice, orchestral instruments), choral music, instrumental conducting, vocal accompanying and coaching, and group piano pedagogy.

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution (students holding other degrees may be admitted but will be expected to make up any deficiencies). Those majoring in musicology are generally expected to have a minimum grade-point average of 4.25 (A = 5.0). Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings. Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each at the college level or two years at the high school level of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students otherwise admissible may satisfy any language deficiencies concurrently with graduate studies.

Degree Requirements: Candidates for the M.Mus. degree in theory-composition and in performance and literature must earn at least 8 units, including 2 units at the 400-level in their major field and 1 unit in problems and methods. Candidates in performance and literature must earn 2 units in the music literature course in their major applied area. Candidates in musicology must earn 2 units in introduction to musicology and 2 units in the seminar in musicology. Electives in music theory, history and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate adviser. Each candidate for the M.Mus. must participate in an ensemble during two of the terms of study. A graduate recital is required of all candidates in performance and literature. Candidates in musicology and theory must write a thesis, for which 2 units of credit are given. Candidates in composition must present a portfolio of their works for approval by the composition faculty.

Doctor of Musical Arts. The fields of specialization for the D.M.A. degree are composition, piano, organ, choral music, voice, violin, viola, cello, wind instruments, and percussion instruments.

Admission. Prerequisites for admission are: (1) The M.Mus. degree from the University of Illinois at Urbana-Champaign, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review, and candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble performance and/or score reading. (4) The successful completion of approximately 32 semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of 6 hours in history and 6 hours in literature and philosophy; candidates in voice must have fulfilled all foreign language requirements considered prerequisites for the M.Mus. degree.

Degree Requirements. Candidates must earn a minimum of 16 units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of 3 units in the major field of specialization, 2 units in advanced music literature courses, and 2 units in a minor field. A preliminary examination is taken once all course work is completed.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition and of performance and literature, 6 units are devoted to a special doctoral project. Composers must produce a large-scale original score. Performers must demonstrate comprehensive repertory study in the form of two solo recitals or one solo recital and two of the following options: a concerto; a major operatic or oratorio role; a chamber music program; a lecture- recital; or the preparation of and, when appropriate, conducting of a concert by an instrumental or vocal ensemble. In addition, both fields have a research requirement that serves in lieu of a thesis. In the field of choral music, 1 unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory, and 4 units are devoted to the writing of a thesis.

Doctor of Philosophy in Musicology. The Ph.D. in musicology is intended for those whose interests lie in research in the history of music, systematic musicology, or ethnomusicology.

Admission. Prerequisites for admission are: (1) The M.Mus. degree in musicology from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution. (2) A minimum of 32 semester hours in the liberal arts and sciences, normally including general history, philosophy, and literature.

Degree Requirements. A minimum of 16 units must be earned beyond the requirements for the master's degree, including at least 2 units in the seminar in musicology. Although no formal outside minor is required, students are expected to take courses in fields outside music that are appropriate to the proposed area of thesis research. A preliminary examination is taken after all course work is completed.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Eight of the total of 16 units are normally devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 4.0. Candidates for this degree must earn a minimum of 4 units in music courses, 2 units in education courses, and 2 units of electives. One of the 4 units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in their major performing medium during the registration period of their first term in residence. Each candidate for the M.S. must participate in an ensemble during two of the terms of study. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. During the student's first registration period, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of 8 units beyond the master's degree is required, including 1 unit in music education courses and 1 unit in educational psychology.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music, music education, or a related academic discipline acceptable to the Graduate Committee for Music Education. Admission is determined by examinations in music history, music theory, music education, and applied music; personal interviews; records of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies test should accompany his or her application for admission.

Program. At least 16 units of work beyond the master's degree are required, including 6 units in music courses and 6 units in education courses. No more than 2 units of credit in applied music may be counted toward the degree. A thesis is required. It may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled by full-time study in two consecutive semesters or in one semester, a contiguous summer session, and one additional summer session.

Financial Aid. Fellowships, teaching and research assistantships and tuition and service fee waivers are awarded on a one-year basis with continuation dependent upon success in the program. Specific information on application procedures is available from the Graduate Office, School of Music.

NUCLEAR ENGINEERING

Head of the Department: Barclay G. Jones
Correspondence and Information: Department of Nuclear Engineering, University of Illinois at Urbana-Champaign, 214 Nuclear Engineering Laboratory, 103 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.A. Axford, D.F. Hang, P.K. Hopke, B.G. Jones, K. Kim, G.H. Miley, R.J. Turnbull
Associate Professors: M. Ragheb, C.E. Singer, J.F. Stubbins, J.G. Williams
Assistant Professors: W.H. Choe, S. Landsberger, B.J. Micklich, A.M. Ougouag, D.N. Ruzic

Graduate Degree Programs. The Department of Nuclear Engineering offers work leading to the Master of Science and Doctor of Philosophy degrees.

Admission. Application for admission to the M.S. and Ph.D. programs is open to all graduates in engineering, mathematics, and the physical sciences with an average grade of B or better for the last 60 hours of undergraduate work and any graduate work completed. Prerequisites for admission include a course in ordinary differential equations plus one other mathematics course beyond calculus; an intermediate course in atomic physics; a course in electrical circuit theory; a course in thermodynamics; and a course in fluid mechanics or a course in continuum mechanics. A student may be admitted before completion of these prerequisites, but he or she must allow additional

time for making up these deficiencies, and such make-ups will not count toward the number of units required for the degree. Transcripts will be reviewed prior to admission, and letters of recommendation are requested plus other information such as rank in class as an undergraduate. If necessary to limit enrollments, admission will be restricted to those judged most worthy. International students must have good proficiency in English as shown by the English Placement Test and the TOEFL (on which they must score at least 550). They may be required to take courses in English as a second language.

Master of Science. The M.S. Degree will usually take at least two semesters and a summer session to be completed. Eight units of graduate work are required, including an M.S. thesis. The curriculum requires courses covering the fundamentals of nuclear engineering, plus two or more courses in an area of concentration chosen by the student in consultation with his or her adviser. Typical areas include: nuclear materials, fusion systems and plasma engineering, energy conversion, radiation protection engineering, reactor physics and radiation transport, reactor thermal analysis and design, and reactor safety and nuclear power economics. At least six units of credit taken must be in nuclear engineering.

Doctor of Philosophy. Course requirements for the Ph.D. degree include at least eight units of course credit beyond that required for the M.S. degree. After this period, one or more years may be needed for the doctoral research and thesis. Students desiring to work toward the Ph.D. degree must pass the qualifying examination to be admitted to doctoral study. After completion of the additional course work, the candidate must pass the preliminary doctoral examination. After finishing the doctoral thesis, he or she must successfully defend it at the time of the final examination. A doctoral student would typically complete about twelve courses in nuclear engineering plus additional courses which support a specialized research area and provide background in mathematics and science. There is no foreign language requirement. Under exceptional circumstances, the doctoral research may be undertaken off campus.

Financial Aid. Fellowships and traineeships are generally available to support the best applicants. Other aid in the form of research assistantships and teaching assistantships is available for most, if not all, of the other graduate students. Other work of a professional nature can sometimes be found in the University or surrounding community. If the number of students is more than the department can assist financially, the support is distributed according to academic merit.

Research Interests. Faculty research interests cover a wide range including, but not limited to, reactor physics and engineering, radiation measurements, fusion and plasmas, nuclear thermal-hydraulics, nuclear safety, nuclear bioengineering, radiation transport phenomena, nuclear materials, and neutron activation.

Facilities. A nuclear reactor, a supercomputer, a dense plasma focus device, and many other major research resources are available for nuclear engineering research. The versatile Illinois Advanced Triga reactor operates at 1.5 megawatts steady state and pulses to 6,000 megawatts peak power. A low-power reactor facility, adjacent to the Triga, provides unique coupled-core experimental capabilities. A dense plasma focus fusion-related device for high-temperature plasma studies and an ultrahigh-vacuum laboratory for plasma-material interaction studies are available. The College of Engineering's Materials Research Laboratory and Materials Engineering-Mechanical Behavior program provide a variety of facilities for studies of nuclear materials. Other laboratories are also available for environmental studies and nuclear spectroscopy; health physics and radiation studies; nuclear waste management; thermal hydraulics and reactor safety; reactor physics and reactor kinetics; controlled nuclear fusion; direct energy conversion; and lasers and plasma physics. The College of Engineering is a leader in supercomputer research, and the campus is one of four National Centers for Supercomputing Applications. The Department of Nuclear Engineering also has a direct link to the National Magnetic Fusion Computer Center in Livermore, California. In addition, microcomputers are available for students' use and are integrated into laboratory courses.

NUTRITIONAL SCIENCES

Director of the Division. John A. Milner

Correspondence and Information: Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, 451 Bevier Hall, 905 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: D.H. Baker, P.J. Bechtel, L.A. Birch, R.A. Boileau, J.H. Clark, J.W. Erdman, Jr., G.C. Fahey, Jr., P.V. Johnston, B.P. Klein, B.L. Larson, J.A. Milner, S.P. Mistry, R.A. Nelson, T. Nishida, W.D. O'Brien, E.G. Perkins, M.F. Picciano, J.L. Robinson, A.J. Siedler, W.J. Visek, J.S. Willis

Associate Professors: B.H. Cho, R.A. Easter, T.F. Hatch, A.K. Hatfield, D.K. Layman, R.L. Magin, M.R. Murphy, A.A. Salyers

Assistant Professors: G. Czarnecki-Maulden, R.H. Deering, A.S. Hassan, E.H. Jeffery, K.S. Keim, K.W. Singletary

Professors Emeriti: C.L. Davis, R.M. Forbes, E. Sleator

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science and Doctor of Philosophy in Nutritional Sciences is offered. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes; animals, including man; nutritional biochemistry; and the chemistry of nutritional compounds and nutrition education. The program offers the opportunity for pursuing both the M.D. and Ph.D. degrees in the Medical Scholars Program.

Admission and Financial Aid. Applicants are expected to have an admission average of 4.0 (A = 5.0) for the last 60 hours of course work and basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of traineeships, assistantships, and fellowships. Applicants seeking August admission and expecting to be considered for financial assistance should file their applications before the preceding February 15th. Later applications will be considered depending on pace and support available.

Master of Science. Requirements for the M.S. include courses in general biochemistry, two courses in advanced nutrition, and one semester of seminar. Additional courses are available in such diverse subjects as human and animal nutrition, biochemistry, physiology, immunology, food science, education, anthropology, psychology, sociology, statistics, and/or agricultural economics. The M.S. degree may be taken with or without a thesis. The minimum course work requirements in units for the M.S. are 6 (plus at least 2 units of thesis credit) and 9 (nonthesis).

Doctor of Philosophy. In addition to maintaining a 4.0 average in formal course work, Ph.D. students are required to take a qualifying examination, an oral preliminary examination, and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to have competence in English. A minimum of 24 units of credit work beyond the baccalaureate degree is required.

PHILOSOPHY

Chairperson of the Department: R.L. Schacht

Correspondence and Information: Inquiries and correspondence should be directed as may be appropriate either to the Chairperson, the Director of Graduate Studies, or the Admissions and Financial Aid Committee, Department of Philosophy, University of Illinois at Urbana-Champaign, 105 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.E. Caton, R.L. Schacht, D.S. Shwayder, J.D. Wallace, P.G. Winch
Associate Professors: H.S. Chandler, T.G. McCarthy, A. Melnick, R.D. Mohr, F.W. Neely, F.F. Schmitt, W.R. Schroeder, S.J. Wagner, R.G. Wengert
Assistant Professors: M.W. Baron, P.L. Maher, R.J. McKim
Professors Emeriti: B.J. Diggs, M.H. Fisch, A.R. Turquette, F.L. Will

Master of Arts. The normal program of graduate study in philosophy is directed toward the Ph.D., but students who wish to work only for the Master of Arts degree may also be admitted.

Admission. The Graduate College admission requirements apply. Applicants need not have done the course work in philosophy expected of applicants to the Ph.D. program, but must show some evidence of aptitude for graduate study in philosophy. Application materials required are the same as those for the Ph.D. program.

Program Description. Students in the A.M. program may qualify for the degree by earning at least 8 units of graduate credit with at least a 4.0 grade-point average (A = 5.0), 6 of which must be earned in regular courses; by satisfying a one-year residence requirement; by submitting a substantial essay; and by passing an oral examination on this essay. (There are no area, logic, or foreign language requirements for this degree.) An A.M. degree earned in this way is normally a terminal one. Students admitted to the A.M. program may, however, petition to the department for admission to the Ph.D. program either prior to or upon the completion of their qualification for the A.M. degree. (Students in the Ph.D. program are automatically awarded this degree when they satisfy the Ph.D. program preliminary examination requirement and are not required to submit the substantial essay or to pass the oral examination required for the terminal A.M. degree.)

Doctor of Philosophy.
Admission. The Graduate College admission requirements apply. In addition, applicants should have had a course in symbolic logic and general courses in the history of ancient and early modern philosophy. Students deficient in these areas may be admitted, but they are required to remedy their deficiencies by taking such courses in their first year. Applicants should also have done some course work in such central areas of philosophical inquiry as ethics and the theory of knowledge. All applications for admission must be supported by three letters of recommentation from persons qualified to comment on the applicant's aptitude for graduate study in philosophy. All applicants are also urged to take the General Aptitude portion of the Graduate Record Examination and to submit their scores. They are further urged to submit a sample of their written work. Foreign applicants whose native language is not English should take the TOEFL examination and submit their scores. (A score of at least 600 is required for regular admission.)

Program Description. The Ph.D. program has three stages. (1) The first stage is completed when a student has earned 8 units of graduate credit or is deemed completed if the student has received a master's degree in philosophy elsewhere. (2) The second stage is completed when the student has earned 8 additional units (or, having received a master's degree previously, has earned and has been allowed transfer credit for a total of 16 units) and has satisfied the preliminary examination requirement, a foreign language requirement, and a logic requirement (see below). (3) The third stage is completed when the student has earned another 8 units of graduate credit (normally in seminars and thesis reseach) and has satisfied the thesis and doctoral oral examination requirements (see below). A minimum grade-point average of 4.0 (A = 5.0) is required for the Ph.D. Candidates must also satisfy the Graduate College residence requirement.

Candidates need not take work in a minor field outside of the department. In cases in which advanced study in philosophy would be enhanced by study in a related discipline, students may use such related course work to satisfy the credit requirements for the degree. Credit toward the satisfaction of these requirements in such cases is limited to 2 units. If a student wishes the work to count as an extradepartmental minor, the minimum number of units accepted is 2 and the maximum is 4.

The department offers four main fields of concentration: (1) The history of philosophy (including recent Anglo-American philosophy and Continental philosophy); (2) the theory of knowledge (including philosophy of science and philosophy of language); (3) metaphysics (including philosophy of mind and philosophy of religion); and (4) ethics and value theory (including social and political philosophy and aesthetics). Students may specialize in any of these areas but must demonstrate competence in all of them. To satisfy the preliminary examination requirement, they must demonstrate such competence either by passing written preliminary examinations in each of these areas or by taking certain courses and passing them with a minimum grade of at least B.

Before the department will certify that a student has satisfied this requirement, the student must also demonstrate either (a) a basic reading knowledge of two of the following languages: German, French, Greek, and Latin; or (b) high proficiency in one of these languages. (Substitution of another language requires the permission of the chairperson of the department.) In addition, the student must demonstrate competence in symbolic logic, either by passing an approved course in the subject or by passing a proficiency examination administered by the department.

There is no separate master's degree requirement for Ph.D. candidates. The A.M. degree in philosophy is automatically awarded to those who have not already earned this degree previously elsewhere when they satisfy the preliminary examination requirement.

Candidates for the Ph.D. who wish simultaneously to pursue advanced degrees in other disciplines (e.g., medicine or law) are permitted to do so. (For example, see the description elsewhere in this catalog of the Medical Scholars Program.) Those who wish to, however, are expected to satisfy the degree requirements specified above.

After satisfying the preliminary examination requirement, a candidate for the Ph.D. must submit an acceptable thesis (dissertation) and pass a final (oral) examination on the thesis. The acceptability of the thesis is judged, and the final examination is administered by the candidate's doctoral committee.

Financial Aid. Financial aid is available to many students in the form of fellowships, assistantships, and waivers of tuition and service fees. The maximum period for which students may expect to receive financial aid is five years. (Exceptions may be made in some cases, e.g., when students are pursuing several advanced degrees simultaneously.) The department reviews the performance in the program of students receiving financial aid each year in order to determine whether their support should be continued. (Students receiving transfer credit for graduate work in philosophy done elsewhere lose one semester of eligibility for financial aid for each four units of transfer credit allowed.)

PHYSICAL SCIENCES

Correspondence and Information: D. Sechrest, University of Illinois at Urbana-Champaign, 368 Noyes Laboratory, 505 South Mathews Avenue, Urbana, Illinois 61801

Graduate Degree Programs. Two degree programs in physical sciences, one leading to the Master of Science and the other leading to the Master of Science in the Teaching of Physical Sciences, are offered for active or potential secondary school teachers. Teacher certification is required for admission to either program. A thesis is optional. No more than 2 units of thesis credit may be applied toward degree requirements. There is no language requirement. At least 3 units of credit applied to these degrees must be at the 400-level.

Master of Science. This program is designed to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa.

All courses in astronomy, chemistry, computer science, geology, mathematics, and physics which normally may be applied for graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus for which calculus is a prerequisite.

Master of Science in the Teaching of the Physical Sciences. Students in this program must earn 4 units in the physical sciences, 2 units in education (see page 86), and 2 units of electives in education or physical science, or, in exceptional cases, in other fields.

PHYSICS

Head of the Department: A.C. Anderson

Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, 215 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A.C. Anderson, G.A. Baym, M.K. Brussel, L.S. Cardman, S.J. Chang, P.D. Coleman, P.T. Debevec, P.G. Debrunner, H.G. Drickamer,J.G. Eden, G. Ehrlich, B.I. Eisenstein, R.A. Eisenstein, C.P. Flynn, H. Frauenfelder, D.M. Ginsberg, G.E. Gladding, E.L. Goldwasser, A.V. Granato, P. Handler, K. Hess, L.E. Holloway, N. Holonyak, J.P. Hummel, I. Iben, E.A. Jackson, L.M. Jones, M.V. Klein, J.B. Kogut, U.E. Kruse, F.K. Lamb, P.C. Lauterbur, A.J. Leggett, D.E. Mapother, R.M. Martin, J.M. Mochel, T. Ch. Mouschovias, A.M. Nathan, T.A. O'Halloran, V.R. Pandharipande, C.J. Pethick, D. Pines, F.M. Propst, M.J. Raether, D.G. Ravenhall, C.T. Sah, M.B. Salamon, K. Schulten, R.O. Simmons, C.P. Slichter, L.L. Smarr, J.H. Smith, J.D. Stack, H.J. Stapleton, G. Stillman, J.D. Sullivan, J.J. Thaler, J.W. Truran, W.D. Watson, W.S. Williams, J.P. Wolfe, S. Wolfram, P.G. Wolynes, M. Wortis, H.W. Wyld, R.D. Young, H. Zabel

Associate Professors: D. Ceperley, Y.C. Chang, T.C. Chiang, E.H. Fradkin, P.M. Goldbart, E. Gratton, S.A. Lamb, K.Y. Lo, H. Morkoc, M.H. Nayfeh, Y. Oono, C.N. Papanicolas, R.L. Schult, M. Stone, D.C. Sutton, J. Wambach, M.B. Weissman, J.E. Wiss

Assistant Professors: S. Errede, M.E.B. Franklin, P.M. Goldbart, N.D. Goldenfeld, S. Granick, D.W. Hertzog, J.M. Izen, G.M. Mozurkewich, N.H. Packard, D.N. Ruzic, D.J. Van Harlingen

Graduate Degree Programs. The department of Physics offers graduate work leading to the Master of Science and the Doctor of Philosophy. There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, biomolecular, and surface physics; the properties of liquid helium; laser spectroscopy of atoms; nonlinear dynamics; and complex systems. Graduate study in several areas of applied physics is available in conjunction with other departments in the University.

Admission. Requirements for admission to the graduate program in physics, in addition to those of the Graduate College, are 20 hours of physics, excluding courses in general physics and including a semester of intermediate theoretical mechanics, and two semesters of intermediate electricity and magnetism or the equivalent. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics, and undergraduate study of a foreign language are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science. This program requires 8 units of graduate courses and is usually

completed in one year of full-time study by students entering in full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the graduate advising office of the Department of Physics.

Doctor of Philosophy. Students working for the Ph.D. degree usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following eighteen months. Departmental requirements for the Doctor of Philosophy, in addition to the general requirements of the Graduate College, are described in a pamphlet which may be obtained from the graduate advising office of the Department of Physics.

Related Programs. For information concerning physics and astronomy, see page 65; for information concerning atmospheric sciences, see page 67; for information concerning biophysics, see page 125; for information concerning geophysics, see page 100. A doctoral program in chemical physics is described on page 72.

PLANT PATHOLOGY

Head of the Department: Richard E. Ford

Correspondence and Information: Head of the Department of Plant Pathology, University of Illinois at Urbana-Champaign, N519 Turner Hall, 1102 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: J.L. Crane, R.E. Ford, E.B. Himelick, S.M. Lim, R.D. Neely, D.F. Schoeneweiss, P.D. Shaw, M.C. Shurtleff, J.B. Sinclair

Associate Professors: C.J. D'Arcy, D.I. Edwards, D.A. Glawe, L.E. Gray, M.E. Irwin, H.W. Kirby, R.B. Malek, G.R. Noel, J.D. Paxton, W.L. Pedersen, S.M. Ries, D.G. White

Assistant Professors: C.E. Eastman, A.D. Hewings, T.A. Melton III, J.K. Pataky, H.T. Wilkinson

Graduate Degree Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the Master of Science and Doctor of Philosophy degrees. All students are required to present themselves for an oral examination in plant pathology before their program-of-study committee after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; mycology; phytobacteriology; fungicides; antibiotics; physiology of fungi; biochemistry of plant diseases; disease resistance; etiology; epiphytology; soil-borne diseases; and variability in plant pathogens.

Admission. Applicants for graduate study are screened by a departmental admissions committee. The Graduate College requirements, including the 4.0 (A = 5.0) minimum grade-point average, apply.

Master of Science. A candidate for the Master of Science must complete 8 units of credit, including the presentation of an acceptable thesis, and pass an oral examination. Three units must be in 400-level courses, and 2 of the 3 must be in the major field. Limited credit in equivalent courses earned at other institutions may be accepted at the discretion of the department head and the student's program-of-study committee. The candidate must maintain an average of 4.0 (A = 5.0) for the master's program.

Doctor of Philosophy. Students working toward the Ph.D. degree usually require three to four additional years beyond the master's. Eight units of course work, including required courses, must be completed beyond the master's degree to qualify for the

preliminary examination. An oral preliminary examination before five faculty members, including at least three within and one from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable thesis. A grade-point average of at least 4.0 is required for the Ph.D. degree.

POLITICAL SCIENCE

Head of the Department: George T. Yu

Correspondence and Information: Graduate Studies Director, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: I.H. Carmen, S.P. Cohen, B. Glad, S.K. Gove, R.E. Kanet, E.A. Kolodziej, D.F. Linowes, R.L. Merritt, S.S. Nagel, P.F. Nardulli, R.F. Rich, R.E. Scott, L.G. Seligman, M.G. Weinbaum, R. Weissberg, F.M. Wirt, G.T. Yu, D.A. Zinnes

Associate Professors: B. Carroll, C. Cioffi-Revilla, J.L. Cohen, S.A. Douglas, A.B. Fields, J.H. Kuklinski, D.M. Pinderhughes, S.T. Seitz, M.E. Weinstein

Assistant Professors: J.W. Fossett, M.A. Krassa, C.L. Mock, R.J. Staal

Graduate Degree Programs. The Department of Political Science offers graduate work leading to the degrees of Master of Arts, Master of Arts in Public Administration, and Doctor of Philosophy. Graduate work is conducted in the following special fields: American government and politics, comparative politics, international relations, political behavior, political theory, and public policy and administration.

Admission. The Graduate College admission requirements apply for all programs. The student should have had a minimum of 20 hours of undergraduate work in political science and cognate disciplines such as economics, psychology, finance, sociology, and/or history. All applicants are required to submit Graduate Record Examination scores, and applicants with prior graduate work are required to submit an example of work written while a graduate student. The minimum TOEFL score, required of all foreign applicants whose native language is not English, is 590.

Master of Arts. Requirements for the master's degree include 8 units of credit and an acceptable thesis or a substantial research essay in a departmental course.

Master of Arts in Public Administration. See Public Administration for further details.

Doctor of Philosophy. A minimum of 24 units is required for the Ph.D. These include 8 units earned toward the master's degree, a minimum of 8 units of course work for the doctorate, and 8 units of dissertation work. Courses taken to fulfill the language-skill requirement are not counted toward the minimum credit requirements. The A.M. degree is not a prerequisite to the doctorate program. Students must be admitted to candidacy and should apply for admission to candidacy in their fourth semester of graduate training. A minimum of three years of full-time study, of which two must be spent in residence, is necessary to complete the doctoral degree.

A doctoral candidate must take at least one proseminar in four of the six fields into which the political science curriculum currently is divided. The language-skill requirements may be met by demonstrating competence either in foreign languages, in quantitative methods and analysis, or in a combination of these as appropriate to the candidate's research interests. Preliminary examinations, written and oral, are required after completion of 16 units beyond the bachelor's degree. The preliminary examinations test competence in a major area of political science and in two minor areas, one of which may be outside the department. Approval of the dissertation proposal will occur within the semester in which the preliminary examinations are passed or no later than two months after successful completion of the examinations. The department also requires Ph.D. candidates to serve for two semesters as teaching assistants as part of their academic work, such experience being considered a vital part of the graduate

program. Further information on all these programs may be obtained by writing directly to the department's office of graduate studies.

Financial Aid. A majority of first-year, as well as continuing, graduate students receive financial assistance from one of several sources. The department has a number of endowed fellowships; these, along with University Fellowships, provide a stipend for at least nine months plus a waiver of tuition and most service fees. Departmental teaching and research assistantships provide a nine-month salary and a waiver of tuition and most service fees. Several additional tuition and partial service fee waivers are also available.

PSYCHOLOGY

Head of the Department: Emanuel Donchin

Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 337 Psychology Building, 603 East Daniel Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: P. Arabie, D.A. Bernstein, D. Birch, M. Birnbaum, W. Brewer, J. Campione, J. Campos, G.L. Clore, J.B. Cohen, M. Coles, J.H. Davis, E. Donchin, D.E. Dulany, C. Dweck, C.W. Eriksen, R. Felner, M. Fishbein, M. Gabriel, W.T. Greenough, J. Hirsch, C.O. Hopkins, L. Hubert, C.L. Hulin, L. Jones, F. Kanfer, S. Komorita, P.R. Laughlin, J. Malpeli, J.E. McGrath, D. Medin, E. Newport, R.D. Parke, J. Rappaport, E. Satinoff, E. Shoben, H.C. Triandis, M. Weir, C. Wickens, R. Wyer

Associate Professors: E. Deiner, F. Drasgow, L. Fitzgerald, D. Funder, D. Gentner, G.Z. Greenberg, R. Hendersen, J. Juraska, G. Logan, G. Miller, B. Ross, E. Roy, W. Schneider, T. Srull, C. Trahiotis, S. Wasserman, F. White

Assistant Professors: J. Andersen, R. Baillargeon, M. Banich, H. Berenbaum, U. Bockenholt, P. Bowman, P. Carnevale, A. Delongis, F. Fincham, J. Flach, D. Klein, A. Kramer, G. Lintern, P. Sanderson, J. Sniezek, T. Supalla, E. Weber

Graduate Degree Programs. The Department of Psychology offers graduate work leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy.

Doctor of Philosophy programs are offered in the following areas of psychology; biological, developmental, cognitive and experimental, clinical, measurement, personality and social ecology, and social/organizational individual differences. The Master of Arts degree is awarded to students in the above programs as an intermediate degree. Master of Science programs are offered as terminal degrees in personnel psychology, engineering psychology, and measurement psychology.

Admission. The Graduate College admission requirements apply for all programs. The candidate for admission to a Master of Arts or Doctor of Philosophy program should ordinarily have the following preparation: a minimum of 15 hours in psychology, a laboratory course in experimental psychology, a course in statistics, a one-year course in another laboratory science, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have some research experience. Applications for admission to part-time study are usually not approved.

Master of Arts. The Master of Arts degree is awarded as an intermediate degree to students who are candidates for the Doctor of Philosophy degree when they have satisfactorily completed 8 units of graduate work, including an acceptable thesis.

Master of Science. The Master of Science degree in personnel psychology, in engineering psychology, or in applied measurement is awarded as a terminal degree to candidates who have had an appropriate applied psychology undergraduate program and who now satisfactorily complete 8 prescribed graduate units in their specialty.

Doctor of Philosophy. The Doctor of Philosophy degree is awarded to candidates who complete an approved program in their area of specialization and meet departmental

and Graduate College requirements for the degree. These must include: at least 24 graduate units beyond the bachelor's degree; satisfactory performance in courses or examinations dealing with quantitative methods, conceptual foundations of psychology, and chosen areas of specialization; a master's thesis or equivalent; appropriate advanced courses and seminars in the area of specialization and in related and supporting areas; satisfactory performance on a doctoral qualifying examination; satisfactory performance on an oral preliminary examination and completion of an acceptable Ph.D. thesis and satisfactory performance on an oral examination in defense of the thesis.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. This usually takes the form of a teaching assistantship for at least one semester.

Medical Scholars Program. This program allows the student interested in medicine and psychology to earn both the M.D. and Ph.D. in psychology degrees while gaining unique multidisciplinary research experience and expertise.

Individually tailored programs of study can be developed within the general requirements of medical training and graduate study in psychology. Degree work will be arranged to accommodate the scheduling requirements of both programs, but the course of study in psychology will be equivalent to that of all other doctoral candidates. More details about the Medical Scholars Program are available from Associate Dean for Academic Affairs, College of Medicine at Urbana-Champaign, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, Illinois 61801.

PUBLIC ADMINISTRATION

Correspondence and Information: Director, Public Administration Program, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: S.K. Gove, S.S. Nagel, P.F. Nardulli, R.F. Rich, F.M. Wirt
Associate Professor: S.P. Cohen
Assistant Professors: J.W. Fossett, C.L. Mock

Graduate Degree Program. The graduate program leading to the Master of Arts in Public Administration is being revised. For current information on the program, contact the Program Director.

RADIO AND TELEVISION

Acting Head of the Department: James W. Carey
Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801.

The Department of Radio and Television has suspended admission to its program leading to the Master of Science degree while it reviews the curriculum and decides on its plans for future instruction in broadcasting. Students interested in earning a master's degree in radio and television may write to the department head to learn the status of the department's plans. For the program leading to the Doctor of Philosophy in Communications, see page 79.

REGIONAL SCIENCE PROGRAM

Correspondence and Information: Regional Science Program, University of Illinois at Ur-

bana-Champaign, 1 Observatory, 901 South Mathews Avenue, Urbana, Illinois 61801

Program Committee: D.E. Boyce (chairperson), P.F. Colwell, A. Getis, G.J.D. Hewings, L.D. Hopkins, T.J. Kim, C.D. Kolstad, H.F. Williamson

Graduate Degree Programs. An interdisciplinary concentration in regional science is available for students enrolled in master's or doctoral degree programs in the following departments: Civil Engineering, Economics, Finance, Geography, Landscape Architecture, or Urban and Regional Planning. Program concentration varies by department and includes emphasis in transportation planning, regional development and planning, real estate and urban land economics, urban and regional analysis, and environmental systems and management. Core courses are taken in regional and social science theory, location theory, and methods of regional analysis. The specific core courses taken will depend upon background and major department. Further specialization may be pursued by making approved selections from among more than forty regional science courses in the participating departments.

Admission. Prospective students should address inquiries to the program office. Applicants desiring a major or minor emphasis in regional science should seek admission to one of the cooperating departments. All degree candidates must complete the requirements of the department in which they enroll. Students specializing in regional science are expected to have a sound background in economics, statistics, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study.

RELIGIOUS STUDIES

Director of the Program: Gary G. Porton

Correspondence and Information: Program in Religious Studies, University of Illinois at Urbana-Champaign, 4016 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801.

The Program of Religious Studies, sponsors teaching, research, and public service in religious studies. Although the program does not itself offer graduate degrees, its eleven core faculty members as well as its seventeen associated faculty members, regularly teach graduate-level courses and serve on thesis committees for other departments. Students interested in pursuing graduate work in religious studies should contact the director of the program to determine how they can best pursue their interests.

ROMANCE LINGUISTICS

Graduate Degree Programs. An option in Romance linguistics is available to candidates for the Doctor of Philosophy in the Departments of French; Linguistics; and Spanish, Italian, and Portuguese. The curriculum is based upon appropriate course offerings in the three departments. Further information may be obtained from the executive officers of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: M.T. Choldin

Correspondence and Information: Director of the Russian and East European Center, University of Illinois at Urbana- Champaign, 1208 West California Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P.P. Bernard, M.T. Choldin, C.L. Dawson, J.D. Fellmann, R.T. Fisher, Jr., M. Friedberg, J. Gorecki, F.M. Gottheil, K.A. Hitchins, H.H. Hock, R.C. Jennings, R.E. Kanet, M.J. Kenstowicz, P.B. Maggs, M. Marcovich, J.P. McKay, J.R. Millar,

L.H. Miller, B. Nettl, J.A. Nichols, T. Pachmuss, A.L. Ringer, S.C. Schmidt, H.M. Schoenfeld, P.W. Schroeder, D.M. Shtohryn, M.G. Weinbaum, L. Zgusta
Associate Profesors: M.H. Berry, E.C. Bristol, R. Dunatov, F.Y. Gladney, S.P. Hill, D. Koenker, H.P. Maguire, K.H. Schoeps, M.M. Shorish, B.P. Uroff
Assistant Professors: R.G. Ousterhout, N. Pervukhin, O. Soffer-Bobyshev, M. Spagat, R. Tempest

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is offered by the Russian and East European Center in cooperation with various departments. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follows: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least 6 graduate units in course work relating to Russia, of which at least ½ unit must be LIS 433C. The remaining units must be distributed among at least three of the departments represented in the program (Anthropology, Economics, Geography, History, Law, Library and Information Science, Political Science, Slavic Languages and Literatures, and Sociology) other than the student's own major department. If the student's major department is one of these nine, up to 1 unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources which must meet, at the minimum, the standard normally required in a master's thesis. A copy of the student's master's or doctoral thesis may be submitted in fulfillment of this requirement.

SLAVIC LANGUAGES AND LITERATURES

(Including Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Bulgarian, and Ukrainian)

Head of the Department: Maurice Friedberg
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: C.L. Dawson, M. Friedberg, T. Pachmuss
Associate Professors: E. Bristol, R. Dunatov, F.Y. Gladney, S.P. Hill
Assistant Professors: N. Perkvukhin, R. Tempest

Graduate Degree Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of Master of Arts in Russian, Master of Arts in the Teaching of Russian, and Doctor of Philosophy with specialization in Russian literature or Slavic linguistics.

Admission. Prospective graduate students of Slavic languages and literatures should have had the equivalent of at least three years of college Russian and some advanced course work in Russian literature. Some acquaintance with other languages and literatures is desirable. Students choosing Russian or other Slavic languages and literatures as a minor subject should consult the department. The Graduate College admission requirements apply.

Master of Arts in Russian. In addition to fulfilling the requirements of the Graduate College, candidates must pass both a written and an oral examination in their major and must pass the Russian proficiency examination. Students may specialize in literature or linguistics. All students must complete a departmental core program comprised of courses in literature and linguistics. No master's thesis is required.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian, 5 units including at least 2 units from courses open only to graduate students; (2) education, 2 units including 1 unit in educational psychology and 1 unit

in educational policy studies; and (3) electives, 1 unit. These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 86 for teacher certification requirements.

Doctor of Philosophy. All candidates for the Ph.D. must fulfill the general requirements of the Graduate College and must have a reading knowledge of two non-Slavic languages, ordinarily French and German. A student may choose literature or linguistics as a major field. In addition to satisfying departmental language proficiency requirements, students must complete 8 units of course work beyond the A.M. degree, of which at least 5 are within the student's major field of study. The student must also complete a minor consisting of three graduate-level courses in a single field or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another modern Slavic language or literature in the original language. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other modern Slavic languages or literatures in the original languages. A thesis is required for the degree of Doctor of Philosophy.

Graduate courses are offered in the following Slavic languages: Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Bulgarian, and Ukrainian.

Financial Aid. Several forms of financial assistance, including University Fellowships, Foreign Language and Area Studies (Title VI) fellowships, teaching assistantships, research assistantships, and tuition and serve fee waivers are available. There are also opportunities for part-time related work in the Slavic and East European Division of the University Library and elsewhere on the campus. Virtually all superior students are assured of some form of financial assistance and also receive the opportunity to acquire classroom teaching experience.

Research Interests. Major areas include East, West, and South Slavic linguistics; language teaching pedagogy; and computer-assisted language teaching. In literature, the fields of specialization include Russian literature of all periods, particularly of the nineteenth and twentieth centuries, Russian literature and society, emigré Russian literature, the Russian romantic and symbolist poets, Russo-Western literary and cultural contacts, and Russo-Jewish literary relations. Other major areas of interest represented include the Soviet and East European cinema, literary translation, Polish literature, and Slavic folklore.

The University of Illinois at Urbana-Champaign has one of the country's two or three outstanding Slavic library collections. The Illinois Summer Research Laboratory on Russia and Eastern Europe brings to the campus more than one hundred postdoctoral researchers from all over the country every year to take advantage of the Slavic library resources. The library's unique Slavic reference service is in year-round operation, answering queries from libraries and individual scholars throughout the country.

SOCIAL STUDIES

Correspondence and Information: J.R. Dahl, Director of the Program, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, Illinois 61801

Master of Arts in the Teaching of Social Studies. Candidates for admission should hold secondary school social studies teaching certificates. The Graduate College admission requirements apply.

Graduate Degree Program. Eight units of graduate work are required. Four units are to be in the social studies (2 of these must be in history); 3 units in educational psychology, educational policy studies, and secondary and continuing education; and 1 unit in an elective chosen in consultation with the director of the program.

SOCIAL WORK

Dean of the School: Daniel S. Sanders
Correspondence and Information: Director of Student Affairs, School of Social Work, University of Illinois 61801

GRADUATE FACULTY

Professors: P.R. Balgopal, K. Gould, E.V. Mech, D.S. Sanders, M.A. Taber
Associate Professors: C.D. Cowger, R.A. Downing, E.N. Gullerud, J.D. Kagle, M.A. Patchner, K.O. Proch, P.A. Meares, M.M. Monkman, A.J. Vattano, S.A. Wattenberg, N.A. Weinberg
Assistant Professors: N. Gustavsson, A. Halter, K. Moroz, E. Segal

Graduate Degree Programs. The School of Social Work offers programs leading to the Master of Social Work and the Doctor of Philosophy degrees.

Master of Social Work. The M.S.W. curriculum may be completed in eighteen months of continuous full-time study. A sixteen-month program is available for students who hold the B.S.W. degree from an accredited institution. Students are encouraged to include electives from other departments. A twenty-nine-week field placement in a social service agency is required. Specializations include child welfare, community mental health, school social work, and health care. There is a direct service and an indirect service track within each specialization. Students may also develop programs in the following areas: aging, industrial social work, marriage and family practice, and substance abuse.

Admission. For the M.S.W. program, applicants must meet the following minimum requirements: (1) Graduation from an accredited college or university with requirements for the bachelor's degree comparable to those of the University of Illinois at Urbana-Champaign. (2) An undergraduate grade-point average of at least 4.0 (A = 5.0) for the last 60 semester hours of undergraduate classes and any graduate work completed. (3) A supplementary statement submitted with the application for admission to the School of Social Work. This is a very important document in support of the application. The outline for this statement appears on the last page of the school's application form. (4) Evidence of personal qualifications suitable to the profession of social work. (5) A minimum of 20 hours in social science courses. (6) A course in statistics. (7) A course in human development covering the life span. (8) Foundation knowledge in human behavior in the social environment including the family, small groups, and organizations. (9) A course in research methods.

Doctor of Philosophy. The Ph.D. program is typically a 16-unit program for students who enter with an M.S.W. degree and is interdisciplinary with a strong research emphasis. Anthropology, economics, education, labor and industrial relations, political science, law, psychology, sociology, and urban planning are among the disciplines that contribute to the program. Candidates are prepared for leadership in teaching, research, policy analysis, development, and implementation.

Admission. The Ph.D. program is open to students who demonstrate a potential for research and other scholarly work and leadership in the field of social welfare and the allied professions, and who have had education in social work or in related professions or disciplines. A grade point average of "B" is required for consideration. The Graduate Record Examination is also required. Three letters of recommendation, an example of written work, and in some cases the Test of English as a Foreign Language (TOEFL) are also required.

SOCIOLOGY

Head of the Department: James R. Kluegel
Director of Graduate Studies: Clark McPhail
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: P. Arabie, D.J. Bordua, H. Choldin, N. Denzin, F. Fliegel, J. Gorecki, L. Hargens, N. Jacobs, H. Johnson, R. Jones, B. Karsh, J.R. Kluegel, G. Lueschen, B. Reskin, J. Robinson, R. Schoen, J. Spaeth, J. Sudman, J.C. van Es, R. Warnecke
Associate Professors: W. Cockerham, A. Flood, C. McPhail, J. Mirowsky, A. Pickering, C. Ross, A. Sofranko, M. Solaun, K. Southwood, G. Stevens, S. Wasserman, N. Wiley
Assistant Professors: R. Sampson, G. Swicegood, W. Trent
Professor Emeritus: W. Form

Graduate Degree Programs. The Department of Sociology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees.

Admission. The Graduate College admission requirements apply. Students applying for admission should have a strong background in one of the social sciences, preferably sociology. Applicants must submit Graduate Record Examination scores on the tests of verbal ability, quantitative ability, and the advanced test in sociology.

Doctor of Philosophy. Considerable specialization around a core of sociological knowledge is encouraged to prepare students for careers in research and teaching at the college and university level and for research careers in government and industry. Departmental programs include population studies; comparative sociology; criminology; social psychology; medical sociology; work, stratification, and organizations; sociology of science; and rural sociology. Required courses include sociological theory, statistics, research methods, demography, social organization, and social psychology. Candidates must also be examined in at least one substantive area plus an area of specialization for doctoral dissertation research. Additional information can be found in the *Sociology Handbook for Graduate Students,* available from the department.

Master of Arts. The Master of Arts program is generally viewed as a first (and optional) step toward the doctorate. Admission requirements are indicated above. A candidate for the A.M. degree in sociology must earn 10 units of graduate credit or 7 units of course work plus an acceptable master's thesis. The course work must include research methods and one advanced course in statistics.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan and Rumanian)

Head of Department: I.A. Schulman
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, 707 South Mathews Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: S.W. Baldwin, W.C. Blaylock, A.K. Cassell, E.P. Garfield, R.E. Lott, A. Porqueras-Mayo, I.A. Schulman, D. Wanner
Associate Professors: A. Aiex, P.W. Borgeson, T.C. Meehan, A. Musumeci, J.C. Wilcox
Assistant Professors: J.F. Lee, P. Sharpe-Valadares, B. VanPatten

Graduate Degree Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy degrees in Spanish, in Italian, or in Portuguese, to a Master of Arts degree in the Teaching of Spanish, and to a Doctor of Philosophy degree in Second Language Acquisition in Teacher Education (SLATE) in Spanish or Italian. Fields of concentration are Spanish linguistics, Romance linguistics, Spanish literature, Latin American literature, Italian linguistics, Italian literature, and Portuguese language and literature. Graduate courses in Catalan and Rumanian are available.

Admission. The Graduate College admission requirements apply. The normal prerequisite for a graduate major is an undergraduate major in the corresponding Romance

language or consent of the department. Applicants living in the United States should submit Graduate Record Examination scores for the aptitude test. Students doing graduate work for any advanced degree in Spanish, Italian, or Portuguese must possess or acquire a practical command of the language. Parallel training in substantive studies on one or more other languages or literatures, such as English, French, German, Greek, or Latin, is desirable.

The programs in Spanish are described below. Similar programs are available for students who wish to major in Italian or Portuguese. For additional information consult the department.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and on a general reading list. Three areas of specialization are offered: Spanish and Spanish American literature, Spanish linguistics, and applied Spanish linguistics. Detailed statements of the requirements for each specialization may be obtained from the department.

Master of Arts in the Teaching of Spanish. An applicant must have a bachelor's degree in either Spanish or teacher education. Candidates must complete a total of 9 units to be taken in various areas (Spanish, foreign language education, general education, psychology, etc.) approved by the adviser in conjunction with the candidate's interests, background, and needs. In addition to completion of course work, a candidate must pass a set of written exams designed to test the ability to integrate those areas studied into a coherent approach for the teaching of Spanish.

Doctor of Philosophy. Students working toward the Doctor of Philosophy degree with an M.A. from this or another university are admitted with provisional departmental status until their performance in graduate work is judged acceptable for full departmental status by the department's graduate committee. Candidates are required to present evidence of a reading knowledge of two other languages to be selected in consultation with the adviser.

Six areas of specialization are available: medieval literature, Renaissance and Golden Age, Spanish literature of the nineteenth and twentieth centuries, Latin American Colonial literature, Latin American Modern literature, Spanish linguistics (with various subfield specializations), and Romance linguistics (with various subfield specializations). For the specialization in Spanish linguistics, general linguistics is a required minor.

The option in SLATE is available to candidates with an A.M. degree in Spanish applied linguistics and at least one year of experience in teaching Spanish as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology in addition to advanced study in Spanish linguistics. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. The departmental requirement is that Ph.D. candidates must teach the equivalent of one academic year at 50-percent time in the basic language course sequence of the department.

Financial Aid. The department offers fellowships to outstanding applicants to the graduate program and regularly provides a large number of teaching assistantships as well as some research assistantships. The Graduate College Fellowship competition is open for qualified minority candidates. Other fellowships and grants are available in campus-wide competitions (Latin American Center grants, Dissertation Research grants, Summer Fellowships, and others).

SPEECH AND HEARING SCIENCE

Acting Head of the Department: Kenneth E. Andersen
Correspondence and Information: Head, Department of Speech and Hearing Science, Uni-

versity of Illinois at Urbana-Champaign, 901 South Sixth Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R.C. Bilger, J.J. O'Neill, C. Trahiotis, E. Yairi
Associate Professors: A.E. Carney, J.G. Erickson, C.J. Johnson, D.P. Kuehn, M.A. O'Neill, R.K. Simpson
Assistant Professors: R.D. Chambers, L.E. Rowan
Professors Emeriti: F. Johnson, E. Paden, W.R. Zemlin

Graduate Degree Programs. The department offers courses leading to the Master of Arts and Doctor of Philosophy degrees, with specialization in audiology, language development and its disorders, speech or hearing science, and speech pathology.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination is required for all curricula. Desired background should include 16 hours of undergraduate credit in the following areas or their equivalent: speech pathology, audiology, phonetics, anatomy and physiology of the vocal mechanism, hearing science, speech science, and voice science.

Master of Arts. In pursuing a Master of Arts, the student may concentrate in one of four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. This degree may be taken as either a terminal degree or as preparation for further graduate study.

As a terminal degree, the Master of Arts program is designed to ensure clinical competence in audiology or speech/language pathology necessary for employment in a hospital, clinic, residential center, or school system. Successful completion of this program ensures that the student has met the academic and clinical requirements for American Speech-Language-Hearing Association (ASHA) certification and can possibly qualify for state certification.

As a nonterminal degree, the Master of Arts program enables the student to undertake fundamental course work that will be an integral part of an overall doctoral program.

The student's program for the Master of Arts degree will be determined on an individual basis, taking into consideration the Graduate College and departmental requirements. It will be comprised of 10 to 13 units from the four specialized areas and related areas. At least 6½ to 7 units must be at the 400-level. The only courses required of all Master of Arts candidates are Speech and Hearing Science 399 (Design and Analysis of Experiments in Speech and Hearing Science) and Speech and Hearing Science 496 (Proseminar in Speech and Hearing Science). A master's thesis should be part of the predoctoral student's plan of study. Students seeking a Master of Arts as a terminal degree are encouraged to do a thesis as educational enrichment.

Doctor of Philosophy. Admission to the doctoral program requires completion of a master's degree, or the equivalent, in speech and hearing science or a related area. The program may be planned with specialization in any one of the four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. The minimum academic course requirements for this degree are 8 units beyond the master's degree and a thesis. If there are deficiencies in the student's background, additional courses will be required, and courses taken for this purpose usually are not counted toward the minimum requirement. In addition, doctoral candidates who did not write a thesis as part of their master's program will be required to complete the equivalent of a master's thesis, and these 2 units will not count toward the minimum academic requirement of 8 units. Individual programs of study will be tailored to the special needs of the student and are planned by the student and the adviser.

If the student enters with no deficiencies, the first year or two of the doctoral program is typically devoted to course work in the area of concentration selected by the student, and terminates when the preliminary examination is passed. Subsequent time is devoted to research on a special topic and culminates with the writing of a thesis and passing an oral examination in its defense.

SPEECH COMMUNICATION

Head of the Department: Jesse G. Delia
Director of Graduate Study: Daniel J. O'Keefe
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: K.E. Andersen, J.J. Bateman, J.G. Delia, C. Kramarae, J.H. Maclay, D.R. Seibold
Associate Professors: R.A. Clark, T.M. Conley, D. Desser, L. Grossberg, D.E. Hewes, B.J. O'Keefe, D.J. O'Keefe, D.L. Swanson, J.W. Wenzel
Assistant Professors: C.M. Condit, N.S. Contractor, A.L. Darling, M.H. Dorfman, J.W. Hay, R.L. Husband, R.K. Stutman, B.J. Tinsley

Graduate Degree Programs. The Department of Speech Communication offers courses leading to the Master of Arts and Doctor of Philosophy and the Master of Arts in the Teaching of Speech Communication degrees.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination and a sample of written academic work are required in all curricula.

Master of Arts. For the degree of Master of Arts, students may concentrate in rhetorical and communication theory or in interpretation. The entering student should present the equivalent of 16 hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general graduation requirements of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional, but may constitute a maximum of 2 units of credit.

Master of Arts in the Teaching of Speech Communication. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College and departmental requirements, including the comprehensive examination, M.A.T. candidates must complete 6 units of work in the department plus the units of required work in education (see page 86).

Doctor of Philosophy. For the Doctor of Philosophy degree, students may concentrate in rhetoric and communication theory or interpretation. Students are accepted as candidates for the Ph.D. degree who present either a well-rounded undergraduate education with an emphasis in speech communication and a master's in a cognate discipline, or who hold a master's degree in speech communication from an accredited institution.

In addition to meeting general requirements of the Graduate College, the student must satisfactorily complete written and oral preliminary examinations, an oral defense of the thesis prospectus, and an oral defense of the thesis. Students must demonstrate competency in research procedures and tools that may include proficiency in one or more foreign languages, various research methods, or cognate academic work.

Specific information on programs of graduate study and financial aid is supplied to all who request it. Financial aid is usually in the form of part-time teaching assistantships.

STATISTICS

Head of the Department: Jerome Sacks
Correspondence and Information: Department of Statistics, University of Illinois at Urbana-Champaign, 101 Illini Hall, 725 South Wright Street, Champaign, Illinois 61820

GRADUATE FACULTY

Professors: R.E. Bohrer, D. Burkholder, L.J. Hubert, P.B. Imrey, K. Joag-Del, F.B. Knight, S.L. Portnoy, J. Sacks, R.A.Wijsman
Associate Professors: D.D. Cox, J.I. Marden, A.T. Martinsek, S. Wasserman
Assistant Professors: J. Alho, A.R. Barron, D.G. Simpson, Z. Ying
Adjunct Professor: James Cole

Graduate Degree Programs. The Department of Statistics offers graduate study leading to the Master of Science (or of Arts) and the Doctor of Philosophy degrees in statistics.

Admission. The Graduate College admission requirements apply. Students are expected to have a strong undergraduate mathematics background but need not have an undergraduate mathematics degree. Students may be admitted with deficiencies which are to be removed during the first year of graduate study.

Master's Degree Program. The M.S. and A.M. degrees in statistics require 8 units of graduate course work covering both theoretical and applied material. Statistics 324, 325, 326, 327, 410, and 411 are required. At least one additional course at the 400-level is also required. There is no language or thesis required, and there are no comprehensive examinations.

Doctoral Degree Program. A total of 24 units after the baccalaureate is required for the Doctor of Philosophy degree. These include Statistics 324, 325, 326, 327, 410, 411, 425, 453, 454, 471, 475, and Mathematics 366. The degree also requires successful completion of the qualifying examinations; the language requirement; the preliminary examination (consisting of examinations on Statistics 324-325; 410-411, and 453-454); a thesis in an area of theoretical, computational, or methodological statistical research; and a final examination on the thesis.

Financial Aid. Financial aid is available primarily in the form of teaching assistantships, research assistantships, and fellowships. For further information write to the head of the department.

Applied Statistics Program. The Graduate College Statistics Program and the Department of Statistics offer the Master of Science degree in statistics with specialization in a variety of areas of application. The degree program consists of a core of three courses in basic statistical theory from the Department of Statistics, a course in general data analysis, and further course work in a particular discipline as required separately for each specialization. The program offers an additional degree for students earning an advanced degree in the area of application or provides the primary degree for a master's candidate in applied statistics who is interested in specific disciplinary application.

To be eligible for this program, a student must be accepted into either the unit offering the specialization or the Department of Statistics. The following areas of application are now available; social statistics (Department of Sociology, School of Social Sciences); psychometrics and behavioral statistics (Departments of Psychology, Educational Psychology, Speech and Hearing Science); biostatistics (biological or health sciences); statistical genetics (Departments of Agronomy, Animal Sciences).

Full statements of degree requirements are available from the head of the unit offering a specialization or from the head of the department.

THEATRE

Head of the Department: David Knight
Correspondence and Information: Head, Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors J.C. Ahart, J.B. Harris, B.M. Hobgood, D. Knight, W. McClure Knight, R. Tymchyshyn, B.R. Works

Associate Professors: J. Dunn, R. Graves, R. Isackes
Assistant Professor: C. Libkin, R. McFarquhar

Graduate Degree Programs. The Department of Theatre offers graduate work leading to the Master of Arts, the Master of Fine Arts, and the Doctor of Philosophy.

Admission. Applicants will be considered if they present transcripts documenting undergraduate or graduate study of dramatic literature, theatre history, and theatre practice; in the case of the M.F.A. degree, intensive experience in performance and/or production of plays is necessary, whether or not this activity occurred in an academic context. The faculty expects all applicants to have a cumulative grade-point average of at least 4.0 (A = 5.0) in the study of theatre subjects; A.M. and Ph.D. candidates are to have a 4.0 grade-point average in all subjects studied at the graduate or undergraduate levels.

Master of Arts. A candidate for the A.M. degree must spend at least two semesters in residence; must complete at least 8 units of course work in theatre and related studies, including at least 5 units in history and theory of theatre and 2 in applied theatre; and must pass a final comprehensive examination. Three units must be at the 400-level, and 2 of the 3 must be in theatre. A full-time student can complete this program in one academic year.

Master of Fine Arts. The M.F.A. is a terminal degree in theatre practice. Approved areas of specialization include acting, directing, costume design, lighting design, scene design, and theatre technology. The candidate for the degree must be in residence six semesters and complete 18 units. Course work must include at least 8 units in studio, colloquium, or creative projects, and 3 others in department-approved electives. Only full-time students will be admitted to the program; residence only in summer sessions will not suffice.

Doctor of Philosophy. Requirements for the degree are a minimum of 8 units in courses in theatre and related studies beyond the master's degree; a reading knowledge of two foreign languages, or of one foreign language and one of the prescribed substitutes; a minimum of 8 units of thesis research; a comprehensive oral and written examination; and defense of the dissertation before a committee of the graduate faculty. The program requires two to three years beyond the master's degree to complete.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: Frederick A. Leckie
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 216 Talbot Laboratory, 104 South Wright Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.J. Adrian, D.E. Carlson, M.E. Clark, H.T. Corten, G.A. Costello, R.E. Johnson, F.A. Leckie, R.E. Miller, J.W. Phillips, R.T. Shield, J.S. Walker, S.S. Wang, W.J. Worley
Associate Professors: J.G. Harris, K.S. Kim, N. Riahi, D.S. Stewart, R.L. Weaver,
Assistant Professors: A. Agah-Tehrani, C.J. Lawrence, T.G. Shawki

Graduate Degree Programs. The graduate programs in the Department of Theoretical and Applied Mechanics lead to the Master of Science and Doctor of Philosophy degrees. Major areas of study and research are applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics.

Admission. Applicants should have the bachelor's or master's degree in engineering, mathematics, physics, or related fields and meet the Graduate College requirements for admission.

Master of Science. Candidates are required to complete a minimum of 8 units of graduate work including a thesis (ordinarily 2 units) and to maintain a minimum grade-point average of 4.0 (A = 5.0). Students are required to register for the seminar in engineering mechanics. If a student elects not to present a thesis, 9 units of course work are required. Three units must be at the 400-level, and 2 of the 3 must be in theoretical and applied mechanics. A full-time student can normally complete this program in one academic year of study. A student who has an assistantship can normally complete the requirements in one calendar year.

Doctor of Philosophy. Candidates for the Doctor of Philosophy degree are required to complete 8 units of course work beyond the master's degree with a minimum grade-point average of 4.0. One course (or the equivalent) is required from each of the following major areas in the department: applied mathematics; dynamics and vibrations; fluid mechanics; materials engineering; and solid mechanics. Students are required to register for the seminar in engineering mechanics. A student must pass an oral preliminary examination before commencing the thesis. The thesis research normally comprises about half of the work beyond the master's degree. A full-time student can normally complete the Ph.D. program in two years of study beyond the master's degree.

Financial Aid. Half-time teaching and research assistantships allow students to take three-quarters of a full schedule of graduate courses. Stipends are based on the student's year in graduate work and on the percentage of time spent on the assistantship. Teaching and research assistantships carry with them waivers of tuition and some service fees. Assistantship applications can be made at any time before the term of entrance. Some University Fellowships are also available.

Research Interests. Some of the areas of theoretical and experimental research currently being investigated by graduate students and faculty members are: fracture control, crack propagation, fiber-reinforced materials, crystal growth-cycle-dependent deformations, plasticity of composites, creep of metals and composites, elasticity, finite elastic deformations, structural optimization, thermoelasticity, elastic stability, evaluation of plasticity theories, finite element methods, dynamic photomechanics, numerical stress analysis, flow of viscous fluids, blood flow in arteries, biomechanics, turbulent boundary-layer theory, magnetohydrodynamics, non-Newtonian fluid flow, atmospheric turbulence, dynamics of springs and cables, elastic wave propagation, acoustics, vibrations of shells, vibration isolation, and combustion.

URBAN AND REGIONAL PLANNING

Head of the Department: Lewis D. Hopkins
Correspondence and Information: Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 1003 West Nevada Street, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: A. Anas, L.F. Blair, D.E. Boyce, C.W. Forrest, W.I. Goodman, A.Z. Guttenberg, L.F. Heumann, G.J.D. Hewings, L.D. Hopkins, T.J. Kim, G.C. Lim
Associate Professor: P.D. Phillips
Assistant Professors: E.R. Jones, L.L. Osborne, P.V. Schaeffer

Graduate Degree Programs. The Department of Urban and Regional Planning offers graduate work leading to the degrees of Master of Urban Planning and Doctor of Philosophy in Regional Planning. Students can also pursue dual degree programs to obtain a Juris Doctor and a Master of Urban Planning or a Master of Architecture and a Master of Urban Planning.

Admission. While the social sciences, the physical sciences, the design professions, engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities and other fields. The Graduate College admission requirements apply. Foreign appli-

cants must score 590 or better on the TOEFL. The Graduate Record Examination is recommended for persons who desire consideration for any type of financial aid. The additional requirements described below apply for admission to the doctoral program.

Master of Urban Planning. The master's degree program is designed to prepare students for careers in professional planning practice. Such careers can involve service in public agencies at any level of government, in private consulting practice, or in other organizations in need of planning services. Alternatively, the program may prepare students for advanced work leading to the Ph.D. degree and a career in teaching and research. The program combines a set of minimum requirements with a high degree of flexibility and choice. The course of study ordinarily requires two years. First-year students take courses focusing on the basic elements of planning, including studies in planning theory, analytical methods, spatial organization, and implementation. The second year provides opportunities for further work in areas of specialized interest, including environment, land use, housing and community development, transportation, socio-economic and preservation planning. Specialization in Regional Science is available in collaboration with other departments on campus. A thesis or a master's project (comparable to the thesis in scope but flexible in the types of projects which can be carried out) is required. An internship during the summer between the first and second year or participation in one of our international summer programs is highly recommended.

To qualify for the Master of Urban Planning degree, a student must complete a minimum of either: (1) 15 units, if a zero-credit internship course (Urban Planning 490) is successfully completed; or (2) 16 Units, if the internship course is not elected. The internship must be preceded and succeeded by at least one semester of course work in residence on the University of Illinois at Urbana-Champaign campus. At least 10 units must be in urban and regional planning courses (9 units for students completing Urban Planning 490). At least 4 units must be at the 400-level, and 3 of these must be in urban and regional planning.

Doctor of Philosophy in Regional Planning. The doctoral program is offered in close cooperation with an interdisciplinary program faculty. The program is designed to educate researchers and teachers for university positions as well as specialized practitioners for the public and private sectors. The program emphasizes environmental science and social science aspects of Regional Planning and incorporates the necessary background in research methods and planning theory and application. Students wishing to pursue environmental science aspects of Regional Planning should have completed at least three courses in physics, chemistry, or biology; one semester of college-level calculus or linear algebra; one semester of statistics; and one semester of economics. Students wishing to pursue social science aspects of Regional Planning should have completed at least one semester of economics; three semesters of economics, political science, or sociology; one semester of statistics; and one semester of college-level calculus or linear algebra. Students otherwise qualified may be admitted with deficiencies in these areas. Deficiencies may be removed by passing proficiency examinations or by taking courses after admission to the program, but courses taken for this purpose will not count toward fulfillment of degree requirements.

To qualify for the Ph.D. in Regional Planning, 24 units of credit must be completed. The student entering with the baccalaureate degree will be required to complete at least 16 units of course credit and up to 8 units of dissertation credit. The student entering with a master's degree in planning or a closely allied field generally will be required to complete a minimum of 8 units of course credit and up to 8 units of dissertation credit. A maximum of 8 units of advanced-standing credit may be granted. All student programs will consist of courses in planning research methods and planning theory and application. Depending on the program emphasis that a student selects, appropriate courses in environmental science or social science aspects of regional planning will be chosen in consultation with the student's academic advisor. The student must pass a qualifying examination, a preliminary examination of the dissertation proposal, and a final examination on the dissertation.

Financial Aid. Fellowships, tuition and service fee waivers, teaching assistantships, and research assistantships are available each year. Financial aid is awarded on the basis of the student's previous academic record and other indicators of potential. In the case of assistantships, the possession of specific teaching or research capabilities is a consideration.

Faculty Research Interests. Members of the faculty are engaged in research, public service, and continuing education through the Bureau of Urban and Regional Planning Research. These efforts are undertaken in the areas of land use, economic development, environmental planning, housing, information systems, social planning, transportation, preservation planning, and regional science.

Library Resources. The department has one of the finest planning libraries in the world, with a collection of books and reports developed during the more than seventy years that planning education has been offered at this university.

Computing Resources. The department has an instructional computing laboratory with sophisticated, graphic workstations to support planning decision making.

VETERINARY MEDICAL SCIENCE

Dean of the College of Veterinary Medicine: Richard E. Dierks

The College of Veterinary Medicine has realigned the administration of its graduate programs from a single program (Veterinary Medical Science) to three programs corresponding to the academic departments in the college (Veterinary Biosciences, Veterinary Clinical Medicine, and Veterinary Pathobiology). Graduate students are admitted directly to one of the three academic department programs.

Veterinary Biosciences

Head of the Department: William C. Wagner

Correspondence and Information: Department of Veterinary Biosciences, University of Illinois at Urbana-Champaign, 3516 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: R.F. Bevill, W.B. Buck, L.E. Davis, L.G. Hansen, J.E. Hixon, G.L. Jackson, R.F. Keeler, G.D. Koritz, M. Manohar, R.S. Ott, A.J. Parker, J.L. Shupe, E. Small, C.W. Smith, J.C. Thurmon, M.E. Tumbleson, A.R. Twardock, W.C. Wagner, H.L. Whitmore

Associate Professors: K.R. Holmes, T.F. Lock, M.R. Simon

Assistant Professors: V.R. Beasley, P.S. Cooke, J.A. Dellinger, J.C. Eurell, T.E. Eurell, A.S. Hassan, G. Iwamoto, E.H. Jeffery, G.J. Pijanowski

Graduate Degree Programs. The Department of Veterinary Biosciences offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Areas of specialization include anatomy, bioengineering, physiology, pharmacology, toxicology, and nuclear medicine. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Biosciences and from other departments of the Graduate College. Laboratory and animal holding space is provided in the Basic Sciences Building, Veterinary Teaching Hospitals, and the Veterinary Research Farm.

Admission. Applicants for graduate study in veterinary biosciences must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire profes-

sional curriculum for those with the D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of graduate credit, of which 4 units must be in veterinary biosciences and a minimum of 3 units must be in courses at the 400-level; (2) ¼ unit of veterinary biosciences seminar credit; (3) a thesis on original research; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree include: (1) 24 units of graduate credit, 12 units of which, including thesis research, must be in veterinary biosciences and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary biosciences seminar credit; (3) reading proficiency in one foreign language; (4) passage of departmental qualifying examination; (5) passage of the preliminary examination; and (6) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of research and teaching assistantships or associate positions are available.

Veterinary Clinical Medicine

Head of the Department: Erwin Small

Correspondence and Information: Department of Veterinary Clinical Medicine, University of Illinois at Urbana-Champaign, 242 Small Animal Clinic, 1008 West Hazelwood Drive, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: G.J. Baker, G.J. Benson, B.O. Brodie, L.E. Davis, J.L. Dorner, L.C. Helper, R.S. Ott, A.J. Parker, E. Small, C.W. Smith, J.C. Thurmon, A.R. Twardock, H.L. Whitmore

Associate Professors: A.H. Brightman, T.J. Burke, J.A. DiPietro, W.E. Hoffmann, A.L. Johnson, S.K. Kneller, D.R. Krawiec, T.F. Lock, J.M. Losonsky, B.C. McKiernan, D.R. Nelson, W.J. Tranquilli

Assistant Professors: R.R. Badertscher, D.P. Bane, M.J. Boero, K.L. Campbell, J.H. Foreman, T.E. Goetz, W.F. Hall, D.M. MacCoy, D.J. McKenna, S.A. McLaughlin, G.C. Petersen, D.D. Sisson, R.D. Smith, L.G. Wheaton

Graduate Degree Program. The Department of Veterinary Clinical Medicine offers a graduate program leading to the Master of Science degree. The primary goal of graduate study in veterinary clinical medicine is to prepare the student for a career of research and teaching in a specialty area. Graduate work in veterinary clinical medicine may be pursued in several fields of specialization including anesthesiology, equine medicine and surgery, food animal medicine and surgery, ophthalmology, radiology, small animal medicine and surgery, and thereiogenology (animal reproduction).

The student's needs for clinical exposure will vary with the candidate and the candidate's field. Advanced clinical training is required. The clinical training can be organized in different ways depending on the student's course work, teaching duties, and research program. Usually, it will be arranged so that the student takes part in clinical work at the Veterinary Medical Teaching Hospital or in the field.

The department also offers a postgraduate clinical training program (residency) that is designed to provide advanced clinical training usually leading to board certification in a specialty. A residency program must be combined with the graduate program to provide the resident with research training.

Admission. Admission requirements include a Doctor of Veterinary Medicine degree or equivalent. By petition, non-D.V.M. applicants with an equivalent degree or education could be admitted.

Applicants for graduate study in veterinary clinical medicine must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between

3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Admission averages are computed from the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire professional curriculum for those with a D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of credit of which 4 units must be in veterinary clinical medicine, veterinary biosciences, or veterinary pathobiology and a minimum of 3 units must be in courses at the 400-level; (2) ¼ unit of veterinary clinical medicine seminar credit; (3) a thesis on original research; and (4) a final comprehensive examination.

Financial Aid. A limited number of teaching associate positions are available.

Veterinary Pathobiology

Head of the Department: John A. Shadduck

Correspondence and Information: Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2522 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, Illinois 61801

GRADUATE FACULTY

Professors: L.G. Biehl, R.E. Dierks, J.L. Dorner, R.C. Meyer, H.A. Reynolds, M. Ristic, D. Segre, J.A. Shadduck, J. Simon, R.D. Smith, K.S. Todd, Jr., W.A.F. Tompkins, D.N. Tripathy

Associate Professors: H.B. Gelberg, W.M. Haschek-Hock, W.E. Hoffmann, V.R. Ivens, M. Segre, A.R. Smith

Assistant Professors: T.A. Bertram, E.C. Hahn, C.E. Kirkpatrick, M.S. Kuhlenschmidt, G.L. McLaughlin, B.C. McMillan, R.K. Sanecki, G. Scherba, S.Z. Shapiro, D.A. Stahl, E.R. Vimr, M.A. Wallig, R.M. Weigel, H.E. Whiteley, J.F. Zachary

Graduate Degree Programs. The Department of Veterinary Pathobiology offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Areas of specialization include epidemiology, immunology, microbiology, parasitology, clinical pathology, and pathology. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Pathobiology and from other departments of the Graduate College.

Admission. Applicants for graduate study in veterinary pathobiology must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the D.V.M. degree or on the entire professional curriculum for those with the D.V.M. degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of credit, of which 4 units must be in veterinary pathobiology and a minimum of 3 units must be in courses at the 400-level; (2) ¼ unit of veterinary pathobiology seminar credit; (3) a thesis on original research or a publishable manuscript; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree are: (1) 24 units of credit (8 units toward the Ph.D. degree are allowed for an M.S. degree completed elsewhere), 12 units of which (including thesis research) must be in the Department of Veterinary Pathobiology and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary pathobiology seminar credit; (3) reading proficiency

in French, German, Russian, or Spanish (other languages may be approved by petition); (4) passage of the preliminary examination; and (5) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of teaching and research assistantships or associate positions are available.

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Where to Write or Telephone for Information about:

GRADUATE ADMISSIONS INFORMATION AND APPLICATIONS: Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820, (217) 333-0035; or the prospective department. For foreign students: International Admissions, University of Illinois at Urbana-Champaign, 10 Henry Administration Building, 506 South Wright Street, Urbana, Illinois 61801, (217) 333-0413.

EMPLOYMENT ASSISTANCE: Student Financial Aid, University of Illinois at Urbana-Champaign, 420 Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820, (217) 333-0600.

FELLOWSHIPS, ASSISTANTSHIPS, AND OTHER FINANCIAL ASSISTANCE: The prospective department or the Fellowship Office, Graduate College, 202 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820, (217) 333-0036.

INTERNATIONAL STUDENTS (PASSPORT, VISA ASSISTANCE): International Student-Staff Affairs, University of Illinois at Urbana-Champaign, 331 Turner Student Services Building, 510 East Daniel Street, Champaign, Illinois 61820, (217) 333-1303.

HOUSING: Housing Information, University of Illinois at Urbana-Champaign, 110 Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820, (217) 333-0050.

MOTOR VEHICLE AND BICYCLE REGISTRATION: Campus Parking, University of Illinois at Urbana-Champaign, 505 East Green Street, Champaign, Illinois 61820, (217) 333-3530.

PERMANENTLY PHYSICALLY HANDICAPPED STUDENTS: Rehabilitation-Education Services, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, Illinois 61820, (217) 333-4602.

VETERANS' EDUCATIONAL BENEFITS: Veterans Educational Benefits, University of Illinois at Urbana-Champaign, 420 Turner Student Services Building, 610 East John Street, Champaign, Illinois 61820, (217) 333-0058.

OTHER INFORMATION: Public Affairs, Swanlund Administration Building, 601 East John Street, Champaign, Illinois 61820, (217) 333-5010.

Reference copies of this publication are available at Illinois public libraries, high schools, and community colleges. Copies of the *Undergraduate Programs, Graduate Programs,* and *Courses* catalogs (the latter briefly describes the content of each course, credit offered, and enrollment requirements) may be purchased at or ordered by mail from the Illini Union Bookstore, 715 South Wright Street, Champaign, Illinois 61820.

GRADUATE PROGRAMS

1990-92

University of Illinois
at Urbana-Champaign

University of Illinois administrative offices at Urbana-Champaign are open Monday through Friday from 8:00 a.m. to 12:00 noon and 1:00 to 5:00 p.m., except on all-campus holidays which are indicated in the University Calendar.

An information center, available to visitors to the campus, is located in the north entrance lobby of the Illini Union. The center is open from 8:00 a.m. to 8:00 p.m. daily, including Saturdays and Sundays, when classes are in session.

Small group information sessions about the campus are available at the Campus Visitor's Center in Lewis Faculty Center, 919 West Illinois Street. Visitors are welcome between 9:00 a.m. and 4:00 p.m., Monday through Friday, excluding campus holidays.

The commitment of the University to the most fundamental principles of academic freedom, equality of opportunity, and human dignity requires that decisions involving students and employees be based on individual merit and be free from invidious discrimination in all its forms, whether or not specifically prohibited by law.

The policy of the University of Illinois is to comply with all federal and state nondiscrimination, equal opportunity, and affirmative action laws, orders, and regulations. The University of Illinois will not discriminate against any person because of race, color, religion, sex, national origin, ancestry, age, marital status, handicap, unfavorable discharge from the military, or status as a disabled veteran or a veteran of the Vietnam era. This nondiscrimination policy applies to admissions, employment, access to and treatment in the University programs and activities.

Among the forms of invidious discrimination prohibited by University policy but not law is sexual orientation. Complaints of invidious discrimination based solely on policy are to be resolved within existing University procedures.

For additional information on the equal opportunity and affirmative action policies of the University, please contact on the Urbana-Champaign campus: William A. Savage, Assistant Chancellor and Director of Affirmative Action (and Title IX and 504 Coordinator), Swanlund Administration Building, 601 East John Street, Champaign, Illinois 61820, (217) 333-0574.

Information contained herein is for informational purposes only and is subject to change without notice. Individual departments and units should be contacted for further information. Courses, faculty assignments, prerequisites, graduation or completion requirements, standards, tuition and fees, and programs may be changed from time to time. Courses are not necessarily offered each semester or each year. The University retains the exclusive right to judge academic proficiency and may decline to award any degree, certificate, or other evidence of successful completion of a program, curriculum, or course of instruction based thereupon. While some academic programs described herein are designed for the purposes of qualifying students for registration, certification, or licensure in a profession, successful completion of any such program in no way assures registration, certification, or licensure by an agency not the University of Illinois.

GRADUATE PROGRAMS

1990-92

University of Illinois
at Urbana-Champaign

With the exception of the cover, this book is printed entirely on recycled paper.

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Officers of the University

BOARD OF TRUSTEES

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1985-91
Susan L. Gravenhorst, *Lake Forest*
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In addition to the above, there are two nonvoting student members elected annually.

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Nini Almy, *Assistant Dean and Assistant Vice-Chancellor for Research*
C. Kristina Gunsalus, *Associate Vice-Chancellor for Research*
Harriett Weatherford, *Associate Vice-Chancellor for Research*
Leslie Mitchell, *Assistant Vice-Chancellor for Research*
Gaye Wong, *Assistant Dean*

Academic Calendar

A Graduate College calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained from the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820.

Some dates on the following academic calendar are presently under review and therefore are subject to change. Please consult your graduate adviser or the Graduate College office at B3 Coble Hall for further information.

Fall Semester 1990

April 4-11	Advance enrollment for fall semester by continuing students
August 20-21	On-campus registration
August 22	Instruction begins, College of Law
August 23	Instruction begins, campuswide
August 28-September 7, noon	Registration of graduate and professional part-time nondegree students
September 3	Labor Day (all-campus holiday)
October 1	Last day for graduate students to add a course for the sixteen-week session
October 31-November 7	Advance enrollment for spring semester 1991 (for continuing students)
November 16	Last day for graduate students to drop a course for the sixteen-week session (no refund for reduced programs is available after September 7)
December 7	Unless removed by this date, an EX grade received the previous semester or summer session becomes an E (graduate students only)
December 7	Last day of instruction
December 10-15	Final examinations

Spring Semester 1991

January 7-8	On-campus registration
January 10	Instruction begins
January 21	Martin Luther King, Jr., Birthday (all-campus holiday)
March 23-31	Spring vacation
May 1	Instruction ends
May 3-10	Final examinations
May 12	Commencement

Intersession 1991

May 13	Instruction begins
May 27	Memorial Day (all-campus holiday)

Eight-Week Summer Session 1991

June 6-7, noon	On-campus registration
June 10	Instruction begins
July 4	Independence Day (all-campus holiday)
July 8	Second four-week term begins
July 31	Instruction ends
August 2-3	Final examinations

Fall Semester 1991

August 26-27	On-campus registration
August 29	Instruction begins
September 2	Labor Day (no classes)
November 27-December 1	Thanksgiving vacation
December 13	Instruction ends
December 16-21	Final examinations

Spring Semester 1992

January 13-14	On-campus registration
January 16	Instruction begins
January 20	Martin Luther King, Jr., Holiday (no classes)
March 7-15	Spring vacation
May 6	Instruction ends
May 8-15	Final examinations
May 17	Commencement

Intersession 1992

May 18	Instruction begins
May 25	Memorial Day holiday (no classes)

Summer Session 1992

June 11	On-campus registration begins
June 15	Instruction begins
July 6	Independence Day holiday (no classes)
July 13	Beginning of the second four-week term of instruction
August 7-8	Final examinations

Graduate Education at the University of Illinois at Urbana-Champaign

The University of Illinois at Urbana-Champaign is a leading center for graduate education in the nation. A distinguished graduate faculty of approximately 2,200 members supervises and guides graduate students in research, scholarship, and teaching.

The faculty members of the Graduate College are among the University's most active scholars. These men and women, who have national or international stature as leaders in their fields, work closely with graduate students. More than eighty faculty members have been elected to the American Academy of Arts and Sciences, the National Academy of Sciences, or the National Academy of Engineering. Nine scientists have received the National Medal of Science while on the faculty.

Professor Emeritus John Bardeen won the Nobel Prize in physics twice—the only person ever to do so. Forty-two faculty members have received the Presidential Young Investigators Award since it was established by Congress in 1984 to support research by outstanding faculty members near the beginning of their academic careers.

The University is the home of numerous national centers conducting research across many disciplines including supercomputing, engineering, education, genetics, and the arts.

The Graduate College is an administrative unit which has jurisdiction over all programs leading to advanced degrees. The Graduate College develops and safeguards standards of graduate work and promotes and assists research by faculty members and graduate students in all fields.

The University of Illinois was founded in 1867 as the land grant institution of the state of Illinois. In the 120 years since its founding, the University has become an institution of international stature. Scholars and educators rank it among the world's great universities. It is recognized for the excellence of its academic programs and its research, as well as for the outstanding facilities and resources available to students and faculty.

THE CAMPUS

Located in the adjoining cities of Urbana and Champaign (population 100,000), the University and its surrounding communities offer a cultural and recreational environment ideally suited to the work of a major research institution. The University is approximately 130 miles south of Chicago, which is easily reached by air, bus, car, or rail. Ready access to major cities on both coasts through daily flights to and from the University's Willard Airport make it possible to maintain the close contact with major cultural centers that are essential to the intellectual life of an international university.

The University is a residential campus of classrooms, laboratories, libraries, residence halls, and recreational and cultural facilities with 200 major buildings on the central campus of 705 acres. Nearby are the University's 1650-acre Willard Airport; Robert Allerton Park, the campus's 1,768-acre nature and conference

center; and 3,600 acres of agricultural land. There are also 3,700 acres of farmland elsewhere in Illinois which are used by the College of Agriculture as experimental fields.

Nearly every facility on campus is accessible to the physically disabled, and the University's programs and services for the disabled have served a model worldwide.

GRADUATE DEGREES

The University of Illinois at Urbana-Champaign enrolls approximately 9,000 graduate and professional students and offers advanced degrees in more than 100 fields of study. In addition to the MA or MS and PhD degrees offered in many disciplines, a number of departments offer work leading to other graduate degrees. Among these are master's and doctoral degrees in professional and performing arts fields and various master's degrees in teaching.

Descriptions of these degrees are given in the appropriate departmental sections of this Graduate Programs catalog. More detailed descriptions of graduate programs and the requirements for the degrees may be obtained from the individual departments.

Graduate Research and Instructional Resources

The University of Illinois at Urbana-Champaign is a comprehensive graduate institution. A distinguished graduate faculty, outstanding research facilities, one of the top-ranked libraries in the nation, and superior computer facilities make the Urbana-Champaign campus a stimulating environment for graduate study and research.

The following pages describe some of the facilities and resources available to graduate students and faculty in ten broad fields of graduate study—agriculture, applied life studies, commerce and business administration, communications, education, engineering, fine and applied arts, law, liberal arts and sciences, and veterinary medicine. The instructional and research programs of individual departments and of interdisciplinary and other graduate units are described in the Programs of Study section of this catalog.

UNIVERSITY LIBRARY

The University Library's resources for advanced study and research are exceptional. It is the third largest academic collection in the nation, housing more than 11 million items, including more than 7,500,000 volumes, 515,000 pamphlets, 600,000 maps and aerial photographs, 1,000,000 music scores and parts, and 3,374,400 microtexts. In addition, the library receives more than 92,000 periodicals, serials, and newspapers. This wealth of material is housed in the Main Library (with 4,100,000 volumes in the book stacks) and thirty-eight departmental libraries at various locations across the campus.

Outstanding collections have been developed in a number of areas. Collections in the humanities include classical literature and archaeology, English literature of the sixteenth through the twentieth centuries, Romance and Slavic literature, German literature of the sixteenth and seventeenth centuries, American humor and folklore, and comparative philology. Collections in the fine arts include architecture, landscape architecture, and music. Subjects of social sciences collections include history of the western United States, Abraham Lincoln and the Civil War, Latin America of the Revolutionary period, the Slavic countries, Ireland, medieval and modern Europe, international law, labor and industrial relations, and political science. Subjects in the sciences and technology collections include agriculture; biological sciences (especially entomology, ornithology, and parasitology); chemistry; geology; mathematics; and physics.

The Rare Book and Special Collections Library houses a superior collection of more than 200,000 volumes, including more than 1,000 incunabula. The collection has three major areas of strength: English history and literature, the history of geology, and the emblem book collection. The Milton collection is the finest in the world, including more than 400 different editions of his works published during the seventeenth and eighteenth centuries. The oldest printed book in the Rare Book and Special Collections Library is a 1455 copy of the Book of Genesis from the Gutenberg Bible; the most valuable is the Audubon Folio on permanent display. A catalog has been published containing the Rare Book and Special Collections Library acquisitions through 1978.

The completeness of the bibliographic and reference facilities makes almost any sort of research possible. In addition, interlibrary loan service is provided for materials not available in the library.

CENTER FOR ADVANCED STUDY

The Center for Advanced Study was established in 1959 as a special unit of the Graduate College. The center was charged with encouraging creative achievement and scholarship by recognizing scholars of the highest distinction and by providing incentives for the highest level of scholarly achievement.

The professors in the center are permanent members of the Center for Advanced Study community, chosen for their outstanding scholarship. Appointment to a professorship in the center is the highest recognition that the campus can bestow upon a member of its faculty.

In an annual competition, the professors select associates and fellows to pursue individual scholarly projects and participate in center activities for one or two semesters. Associates are chosen from distinguished tenured faculty; fellows are selected from promising untentured faculty at the University of Illinois at Urbana-Champaign.

Over the years the center has expanded its mission to serve the campus community by providing opportunities for crossdisciplinary discussion and research, interaction with outstanding visitors, and presentations by prominent UIUC scholars. Through its MillerComm public lecture series, the center supports presentations by outstanding scholars and public figures from outside the campus.

RESEARCH SERVICES OFFICE

The Research Services Office (RSO) assists faculty, staff, and students in identifying funding support for research and scholarship activities. The IRIS data base of sponsored opportunities identifies potential sponsors for research, teaching advanced study, dissertation support, travel, equipment, and other activities. Developed at the University of Illinois, IRIS has information on more than 5,000 sponsors that support these activities, including federal agencies and corporations. Current literature on such opportunities and reference materials on research-related topics are available at RSO and include proposal writing, proposal budget preparation, and sponsor identification and analysis. Professional staff members are available to assist in structuring funding searches or in using office resources.

Faculty, staff, and students on the Urbana-Champaign campus can use the following RSO resources: current literature on research and scholarship sponsors, reference publications, telephone directories of federal agencies, and handouts spanning topics from proposal preparation to University of Illinois at Urbana-Champaign rules and regulations pertaining to research.

BECKMAN INSTITUTE FOR ADVANCED SCIENCE AND TECHNOLOGY

The Beckman Institute for Advanced Science and Technology is a unique facility in which researchers at the University of Illinois at Urbana-Champaign address fundamental questions in engineering and in the physical, behavioral, and biological sciences. The results of the research efforts of more than twenty interdisciplinary groups will make possible advances in the understanding of human and artificial (or machine) intelligence. The research programs of the institute were

chosen by a panel of senior faculty members from among more than fifty program proposals.

Researchers in the institute are drawn from more than a dozen different departments at the University, from computer science to biochemistry to philosophy. Visitors also form an important ingredient in the intellectural environment at the institute. At any given time, dozens of visitors from other universities, from industry, and from government can have the use of offices and other facilities to work with research groups in the building.

The Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign is the largest and most ambitious university-based multidisciplinary research facility in the country. Its programs will test the hypothesis that reducing the barriers between the scientific disciplines yields advances that traditional approaches to research could not.

NATIONAL CENTER FOR SUPERCOMPUTING APPLICATIONS

The National Center for Supercomputing Applications (NCSA), a special unit of the Graduate College, is one of five centers funded by the National Science Foundation (NSF) in February 1985 to start a new national supercomputing program for university researchers.

NCSA has developed a comprehensive computational environment, currently centered on two supercomputers (a CRAY X-MP/48 and a CRAY-2), to support the research and educational needs of the national research community. Allocations on the NCSA systems are awarded by either the Peer Review Board or the Small Allocations Committee. A graduate student can gain access through his or her adviser or through a group that has been allocated time on the system.

NSF placed the new national centers at major research universities to provide fertile ground for the multidisciplinary exchanges needed to create new fields in computational science. The University of Illinois at Urbana-Champaign founded an Interdisciplinary Research Program (IRP) within the NCSA to focus this process. The IRP is a new type of scientific program built around a comprehensive, integrated computational network that facilitates frontier research and the sharing of knowledge across disciplines. During the spring of 1989, the IRP expanded its operations into the new Beckman Institute. The IRP supports a variety of intellectual programs involving national visitors; staff research scientists; University of Illinois adjunct faculty and postdoctoral, graduate, and undergraduate students; computer scientists; and computer professionals.

NCSA does not directly fund research projects but provides the environment in which they can be carried out effectively. The center is a training ground for graduate students working on IRP-affiliated projects. Training includes the use of not only supercomputers but also workstations and productivity software for research purposes. In addition, NCSA sponsors many educational activities open to the entire University community, such as seminars and technology demonstrations.

NCSA's approach is to develop a computing system based on proven technologies while providing an upgrade path to maintain a state-of-the-art system. To provide faster, more reliable access by researchers to their files, NCSA has increased both the amount of storage available and the speed at which files are transferred for center users. NCSA's mass storage system uses network-based hierarchical Common File System (CFS) software developed at Los Alamos National Laboratory and enhanced at NCSA. More than a terabyte of data is now stored at the NCSA

CFS system. The Cray supercomputers, the mass storage system, and various high-quality output devices are connected via a HYPERchannel backbone network.

Software packages are supported at NCSA for most branches of science and engineering. In addition, the NCSA Software Tools Group develops software tools for computational scientists and turns prototypes into products. Its highly successful communications package, NCSA Telnet, is used by more than 20,000 researchers in the United States and Europe. Its integrated suite of color imaging and data analysis tools is also used worldwide. Current projects include communications packages, image analysis and display, presentation tools, and distributed solutions that will more closely integrate scientists' workstations into the supercomputing environment.

The networked workstation environment of NCSA is designed to enhance research productivity and to give faculty and students experience with state-of-the-art tools and techniques in computing.

CENTER FOR SUPERCOMPUTING RESEARCH AND DEVELOPMENT

The Center for Supercomputing Research and Development (CSRD), established in late 1984, is a special unit of the Graduate College. CSRD is involved with advancing the state of supercomputing in three areas: (1) engineering and architecture, (2) software, and (3) algorithms and applications. CSRD's goal is to demonstrate that supercomputers of the future can exhibit efficient, general-purpose behavior and be easy to use. Activities are based on the algorithm, architecture, and software work conducted at the University of Illinois at Urbana-Champaign for the past fifteen years.

Basic research and development at CSRD is focused on the Cedar system, a prototype large-scale multiprocessor that is being built at the center. Cedar will be used to explore multiprocessor performance, develop software to exploit shared-memory multiprocessors effectively, and provide high performance over a wide range of applications.

Engineering and Architecture

In the realm of engineering and architecture, methods are being developed to construct a communication structure (switch) that can support the data transfer, interprocessor communication, and process synchronization requirements of a large-scale multiprocessor. To support a very large number of fast processors, the communication structure must be scalable technologically and architecturally. Research will also be conducted to determine optimal methods by which the control of a multiprocessor can be fully distributed (global). A third major area of research involves the development of the most appropriate methods for synchronizing processes, processors, tasks, and computations for a variety of specific applications.

Software

Extensive experimentation into compilation techniques for a vector/multiprocessor is continuing at CSRD. The Parafrase System, which provides automatic vectorization and multiprocessing of programs, has been implemented. Software research is also continuing in the management of cache and virtual memory in multiprocessors. Another focus of software investigation will address operating

system problems, such as scheduling and queue access, that can result from the use of a large number of processors.

Algorithms and Applications

Numerical algorithms for solving important problems in nuclear reactor safety studies, such as obtaining energy by controlled fusion, atmospheric modeling, and hydrodynamic simulation, have taxed the capabilities of existing computers to the limit. The availability of vector machines such as the CRAY and Cyber 205 resulted in some speedup, but for many applications, it has not been substantial. At CSRD the foundation has been laid for the development of basic multiprocessor algorithms that are counterparts of well-developed and well-understood sequential algorithms. Cedar will provide the opportunity to understand the limitations of certain algorithms as the number of processor clusters increases and will assist in the development of algorithms that are more suitable for massive parallelism.

Computational Science and Engineering

The availability of powerful new computers has made it possible to use computational methods in larger and broader areas of science and engineering. Making effective use of computers grows increasingly difficult, partly due to the complexity of these new computers and their software.

The field of computational science and engineering deals with the use of computers in solving real problems in science and engineering. All aspects of the effective use of computers are considered, including the design and implementation of more effective hardware, software, applications, and algorithms.

In cooperation with other departments on campus, CSRD has established graduate study programs in computational science and in engineering. Contact the center for further information.

COMPUTING SERVICES OFFICE

The Computing Services Office (CSO) on the Urbana-Champaign campus provides computer support for instructional and research programs throughout the University. CSO supports two main operating systems, VM/CMS and UNIX, which run on IBM, CONVEX, Pyramid, Sequent, and DEC machines. These machines are interconnected and serve a network of remote facilities, public terminal sites, graphics equipment, and dial-up terminals. In the past several years, CSO has been developing and operating a campuswide network based on optical fiber. Recently, funding has been approved to extend this to all major buildings and to build local area networks (LANs) within buildings.

Members of more than 100 University departments use CSO facilities. The graduate curricula are heavily dependent on computing support, and a large percentage of thesis research requires some computer use. Approximately two-thirds of the use is related to graduate programs and research. Unusual areas of strength include computer music and computer art, in addition to computer use in more quantitative disciplines.

Administration of computing facilities is guided by the principle that users should have easy access to computer support. Access to CSO's systems is provided through formal allocations for courses and research and through a "limited free access" policy for students. In addition to its own facilities, CSO arranges access to other computing facilities within the University.

The University owns a vast array of computer resources, including personal computers, minicomputers, mainframes, and supercomputers. This equipment is supported by UIUCnet, which delivers basic services—electronic mail, file transfer, access to remote networks, access to the library card catalog, a timely weather report, the online student/staff directory, and several commercial data bases. Standard hardware components based on national standards have been used, providing a firm basis from which to build a ubiquitous campus network.

CSO offers a full complement of computer-related user services, including consulting on systems, microcomputers, software packages, and hardware. A Network Design Office provides campus departments with local area network designs, supervises the installation of these networks, and offers training and consulting support to network users. Support services in hardware maintenance and text processing are also available on a limited basis. Short courses and seminars are taught by the staff. A Microcomputer Resource Center is available where users may try out various software packages and microcomputers or may copy free public-domain software.

The mainframe facility, CSO North, is in the Digital Computer Laboratory and houses the various computers and most of the CSO offices. Consultants offer a wide range of services on a walk-in/phone-in basis. A second facility, CSO South, is in the Commerce West Building. Other public sites are located in the Mechanical Engineering Building, Lincoln Hall, the Psychology Building, Turner Hall, Noyes Laboratory, the Illini Union, Everitt Laboratory, the English Building, and several residence halls.

The long tradition of computer use at Illinois has led to widespread strength both within CSO and across the campus.

COMPUTER-BASED EDUCATION RESEARCH LABORATORY

A unique computer-based educational system has been developed (starting in 1960) at the Computer-based Research Laboratory (CERL) on the Urbana-Champaign campus. The system, originally named PLATO™, is an interactive, time-sharing system whose computers control hundreds of terminals throughout the country. The original CERL Cyber system is still operating, but it has been joined by NovaNET℠, a new super-size, more affordable version of the PLATO™ system with an extensive communications network. NovaNET℠ offers innovative technical features such as high-speed, low-cost, central processors capable of handling several thousand terminals per system, and a variety of communications options to meet user needs, including satellite data transmission and access to local and national networks.

CERL has cooperated with faculty members in many departments who have wished to develop courseware for the system and to incorporate it in their instruction. There are approximately 400 PLATO™ terminals on the Urbana-Champaign campus, more than 250 of which are available for student use. Individualized instruction with immediate and rapid feedback is offered in many campus courses for undergraduate and graduate students. Lessons now exist in more than 100 subjects. The system offers a communication device, providing electronic mail service and immediate message exchange between users, and also plays a role in the recreational life of the campus with its variety of interesting games.

Although the Cyber computers are primarily dedicated to educational use and provide teaching facilities for more than 1 million hours of student and author use

per year, hardware and software research continues in the laboratory. Opportunities are available for research in designing other types of terminals and improved communication devices as well as in developing the delivery of PLATO™ materials to cable television and to improve the delivery to NovaNET℠.

As of June 1989, almost 20 million user-service hours had been delivered on the Cyber system since 1978, and more than 202,000 user-service hours had been delivered on NovaNET℠ since it became operational in 1987.

In addition to the University of Illinois at Urbana-Champaign computer-based educational systems, there are many other PLATO™ systems not only in the United States, but worldwide. Lessons for the systems are transferable from one system to another. The courseware is written in TUTOR, a powerful and efficient language originally created for the CERL system, which allows text and graphic designing, programming, and testing of lesson material by the authors directly at their terminals. The CERL systems are also used for scientific computation, information retrieval, word processing, data processing, and personal services.

BIOTECHNOLOGY CENTER

The Biotechnology Center, a special unit of the Graduate College, is an organization of more than 100 different members of the Urbana-Champaign campus from more than a dozen departments that have active research programs spanning a broad range of biotechnology research areas. The center supports an expanding industrial-affiliates program that promotes interaction between faculty and scientists in industrial research settings.

The Biotechnology Center administers five centralized service facilities: the Genetic Engineering Facility, the Cell Science Laboratory, the Molecular Graphics Facility, the Fermentation Facility, and the Transgenic Animal Facility. The Genetic Engineering Facility synthesizes peptides and DNA oligonucleotides and performs protein sequencing and amino acid analysis for faculty and for industrial affiliates. The Cell Science Laboratory has a hybridoma facility for making monoclonal, antibody-producing cell lines and a flow cytometry facility with three state-of-the-art fluorescence-activated cell sorters. The flow cytometers are available to all faculty members and graduate students for use in conjunction with their research efforts. A full-time operator is available to run samples and to train staff in the use of these sophisticated instruments. The Molecular Graphics Facility has four Silicon Graphics Iris workstations with several sophisticated software programs for the display and manipulation of macromolecules. The Fermentation Facility is supervised by a trained chemical engineer who operates 20-, 30- and 200-liter fermenters for the growth of large quantities of microorganisms. The Transgenic Animal Facility is jointly supported with the College of Agriculture and is available to help faculty test gene constructs in transgenic mice.

The Biotechnology Center has supported interdisciplinary graduate courses and workshops in biotechnology and organizes an annual conference on biotechnology research each spring on the Urbana-Champaign campus.

MICROELECTRONICS LABORATORY

The Microelectronics Laboratory is a multidisciplinary facility in the College of Engineering for investigating new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors. Within the laboratory, the National Science Foundation–sponsored Engineer-

ing Research Center for Compound Semiconductor Microelectronics, with its research, educational, and industrial outreach programs, focuses on the investigation of optical interconnect technologies to eliminate the bottleneck of metal interconnects in high-speed digital systems, with the special goal of triggering the development of new technologies by industry. The crossdisciplinary program is aimed not only at research, but also at the education of undergraduate and graduate students in the most advanced concepts and practices in microelectronics.

The laboratory includes four special groups of facilities: those for artificially structured materials, including MBE and MOCVD epitaxial growth; those for submicron device fabrication, including electron beam and optical lithography, plasma-assisted deposition of oxides and nitrides, reactive ion etching, and plasma etching; a facility for ultra–high-speed optical and electrical measurements; and facilities for characterization of ultra-high purity semiconductors.

A new building is under construction to house the Microelectronics Lab and is expected to be occupied completely by the summer of 1990. Funded by the state of Illinois, the $13.5 million, 50,000 square-foot building includes state-of-the-art clean-room space for crystal growth, fabrication, and semiconductor device processing, as well as general-purpose laboratories and offices. The building is the first university facility in the world to be built in accordance with the H6 fire and safety codes applicable to semiconductor laboratories. The clean-room area consists of 8,000 square feet of clean-room space and is in an isolated, reinforced concrete enclosure that is vibrationally tuned to a limit of 10-20 microinches at any frequency. A second phase of construction, targeted for the early 1990s, will provide an additional 20,000 square feet of general-purpose laboratories as well as offices to house university and industrial researchers. The University is seeking industrial, private, and public support to fund phase two.

PROGRAM FOR THE STUDY OF CULTURAL VALUES AND ETHICS

The Program for the Study of Cultural Values and Ethics is an interdisciplinary unit for the advancement of inquiry in the humanities, social sciences, and arts. The program serves to help faculty support research, develop courses, and conduct conferences in areas that relate to the evolution, understanding, and implementation of cultural values and ethical systems. The UIUC faculty may apply and be appointed to the institute for terms of from one semester to three years for interdisciplinary activities relating to the study of cultural values and ethics. The program provides several research assistantships and fellowships to graduate students who wish to pursue research in these areas. Activities of the program also include seminars, short courses, and artistic projects. The program plans to publish lectures, books, articles, reports, and a journal.

CENTER FOR THE STUDY OF READING

The Center for the Study of Reading is a multidisciplinary community of researchers and scholars who conduct basic and applied research and engage in practical programs designed to produce a better understanding of how people learn to read, how they comprehend what they read, and how they can be taught to read.

Examples of continuing programs of basic research at the center include investigations of perceptual processes in reading and children's knowledge acquisition in the content areas. Continuing applied research programs include analyses of textbooks, the development and evaluation of improved techniques for teaching

reading, and children's vocabulary growth and development. The center's practical programs include the Adoption Guidelines Project, which has developed a series of booklets for use by textbook adoption committees in selecting basal reading programs.

The work of center is disseminated to educators, researchers, and others interested in reading research and education through its Technical Reports series and through publications such as *Becoming a Nation of Readers, 10 Ways to Help Your Children Become Better Readers,* and *Independent Reading: Suggestions for the Classroom.*

The center also sponsors an annual summer institute for teachers, Becoming a School of Readers, and an annual meeting, the Conference on Reading Research, held prior to the conference of the International Reading Association.

PHI KAPPA PHI

The purpose of Phi Kappa Phi is to encourage and recognize excellence in scholarship throughout institutions of higher learning. This national honor society recognizes superior scholarship in all academic disciplines. To be eligible at this University, a graduate student in good standing either must have at least 6 graded units at the University of Illinois and a grade-point average of 5.0, or must have passed the preliminary examination for the doctorate and have completed at least 10 graded units of course work with an A grade and a GPA of 4.83 or better for all graduate work. Invitations to membership are mailed to all eligible graduate students, and an initiation program is held near the end of each semester.

AGRICULTURE

The College of Agriculture is recognized throughout the world for the excellence of its research and the innovations resulting from this work. For more than 120 years the college has helped to improve commercial agriculture and also has helped to protect the environment, to preserve our natural resources, and to better the quality of life in both home and community. Much of the work of the college involves searching for solutions to specific problems and opening new opportunities to transfer this knowledge. The college has active programs in four broad areas: teaching, research, extension education and public service, and international agriculture. The college includes the School of Human Resources and Family Studies, with its four divisions (Family and Consumer Economics; Foods and Nutrition; Human Development and Family Ecology; and Textiles, Apparel and Interior Design); the Division of Nutritional Sciences; the Departments of Agricultural Economics, Agricultural Engineering, Agronomy, Animal Sciences, Food Science, Forestry, Horticulture, Plant Pathology; and the Office of Agricultural Communications and Education. Students can choose graduate programs in Agricultural Education and Home Economics Education as well. Approximately 10,000 acres of college farmland in all parts of Illinois are used for experimentation. In the college there are currently 986 academic and professional staff members.

Programs for graduate students in the various units are described in their sections in this catalog (see Programs of Study). Approximately 300 College of Agriculture faculty members belong to the Graduate College. About 650 graduate students register each year for work in the college, and approximately 60 PhD and 130 MS degrees are conferred annually.

Graduate students are an integral part of the research conducted through the

Agricultural Experiment Station. Because research often involves more than one field of study, much of it is conducted in cooperation with other colleges on the Urbana-Champaign campus, with the state surveys on campus (Geological, Natural History, and Water), with the U.S. Department of Agriculture, and with other agricultural colleges. Interdisciplinary research is encouraged in such special areas as crop and animal production and uses, environmental quality, pest management, the International Soybean Program (INTSOY), and food and nutrition. Financial support for research comes from state appropriations, from federal appropriations and contracts, from international agencies, and from private gifts and fellowships.

Illinois education, agriculture, and agribusiness are in the forefront of world food production and development. Several courses in the departments of the college emphasize international agriculture; research is conducted with the goal of assisting developing countries to expand their own food production and distribution. Faculty exchanges and cooperative research with foreign institutions and agencies offer opportunities for mutually beneficial programs. The broad supervision of the college's international activity is in the Office of International Agriculture. Some major international interests in the College of Agriculture include soybeans, maize, animal agriculture, and nutrition.

The college's extension education work is conducted through the Cooperative Extension Service, which has a staff of state, regional, and county specialists in 110 offices throughout the state. The Cooperative Extension Service has 482 academic and professional staff members and about 421 paraprofessionals and other support personnel.

The Agricultural Experiment Station coordinates the college's research program. The majority of the staff of 155 professional scientists, 307 professional workers, 115 technicians, and 157 other workers also have assignments in one of the other program areas in the college. There are approximately 400 active projects in the station being conducted on campus and at the 15 research centers throughout the state of Illinois.

APPLIED LIFE STUDIES

The College of Applied Life Studies consists of the Departments of Health and Safety Studies, Kinesiology, and Leisure Studies; the Division of Campus Recreation and Rehabilitation Education (see Resources, Facilities, and Services); and the Institute for Research on Human Development, an interdisciplinary research unit.

The Department of Health and Safety Studies promotes human health and safety through research, instruction, and service. Its programs prepare graduates to undertake research in community health, health services, health policy, health behavior, health education, and epidemiology and to serve as professionals in the health field on the state, national, and international level. Research facilities in the department include a general-purpose resource laboratory and community-based field sites.

The Department of Kinesiology focuses on the study of human movement and physical activity. The teaching and research programs are concerned with humans as physically active organisms, with special reference to the components, determinants, and development of movement patterns in action, together with the impact that engagement in physical activities has on individuals, societies, and cultures. Human movement is studied in terms of diverse forms of motor behavior and motor skills found within a wide range of physical activities, including athletic training, dance, exercise, physical recreation, sport, and work. The graduate pro-

grams (MS, PhD) of Kinesiology are organized around three areas that relate to the study of human movement: 1) the biodynamics of physical activity; 2) coordination, control, and skill; and 3) the social science of physical activity. There are also professionally oriented master's degree programs in pedagogical kinesiology (MST) and therapeutic kinesiology (MS). The graduate programs provide the scholarly basis for a variety of careers for kinesiologists in the performing arts, education, health-related fields, industry, the military, and sport.

The Department of Leisure Studies focuses on our understanding of leisure behavior and services that provide leisure activities. Areas of research and teaching include leisure service administration; therapeutic recreation; and the sociology, psychology, and anthropology of leisure. The Leisure Behavior Research Laboratory is a departmental unit concerned with research on leisure behavior. The Office of Recreation and Park Resources, which is merged with the Cooperative Extension Service of the College of Agriculture, offers consulting services and continuing education and serves as a laboratory for conducting research on recreation programs throughout the state.

The mission of the Division of Rehabilitation Education is to research issues concerning the rehabilitation of persons with disabilities and to provide information and services to disabled members of the University community that will help them fully use their educational and professional abilities. This is accomplished by offering both academic and nonacademic services.

The division offers graduate programs to prepare rehabilitation professionals in the areas of rehabilitation administration, rehabilitation counseling, and general rehabilitation. It works with established undergraduate programs to increase awareness of issues concerning the disabled and supports research programs throughout the University that are concerned with disability and rehabilitation.

The Institute for Research on Human Development is an interdisciplinary research unit concerned with health and human development. It is directed toward understanding and promoting optimum health, human development, and performance. The institute has an established national reputation for its work in a number of areas including gerontology, motivation, psychopharmacology, and performance assessment. Institute programs are characteristically undertaken in cooperation with other University departments such as human development and family ecology, health and safety studies, and rehabilitation education.

Within the Institute for Research on Human Development, the Office of Gerontology and Aging Studies serves the campus as an information center for gerontology and supports undergraduate specializations in gerontology, which have been inaugurated by several departments. The long-term goal of the office is to develop a strong gerontology program for the UIUC campus in collaboration with other university programs and state agencies.

COMMERCE AND BUSINESS ADMINISTRATION

The College of Commerce and Business Administration is a leader in business education. One of the original units when the University of Illinois began in 1867, the college has consistently rated in the top ten nationally for the quality of its programs and the scholarship and teaching excellence of its faculty.

The college offers graduate work in its top-ranked Departments of Accountancy, Business Administration, Economics, and Finance. In addition to the masters and doctoral degree programs in these four departments, students may choose to work toward professional degrees: the Master of Accounting Science (MAS), the

Master of Business Administration (MBA), the Executive MBA, the Master of Science in Policy Economics (MSPE), and the Master of Science in Business Administration (MSBA), including the MSBA International Managers Program.

Joint degree programs include the JD and MAS, MAS and Bachelor of Arts in Liberal Arts and Sciences, MAS and Bachelor of Science in Computer Science, JD and MBA, MBA and Master of Architecture, MBA and Master of Computer Science, MBA and Master of Science in Electrical Engineering, MBA and Doctor of Medicine, MBA and Bachelor of Arts in Liberal Arts and Sciences, MBA and Master of Arts in Public Administration, MBA and Master of Industrial Engineering, MBA and Master of Mechanical Engineering, and MBA and Master of General Engineering.

Although the lecture-discussion form of teaching is widely used in the college, the faculty uses a variety of other resources. Organization theorists use the Behavioral Laboratory for evaluating the small-group–decision-making process. The computer is widely used in teaching accounting, statistics, finance, and operations research. In business administration and finance courses, many cases and simulation programs depend on the computer to generate analytical information. Also, many courses involve students in writing computer programs or using the large library of computer programs for research.

An important development in the college is the Office of Information Management, financed jointly by a grant from the IBM Corporation, college and university funds, and other corporate donations. The major goal of the office is to coordinate the development of computer applications in the course curriculum, to supervise computer laboratories used for general student projects that simulate specialized business information system environments, and to provide a focal point for research-related information systems and their impact on management and its operations. The facilities and activities of the office permit the college to give students experience in state-of-the-art equipment and programs in information systems.

Faculty and students rely heavily on the outstanding University Library, which has a large collection of books, reference documents, serials, periodicals, and company data. The Executive-in-Residence Program and the Chief Financial Officer Lecture Series bring visiting business executives to the campus to present lectures and lead discussions on specific topics.

The Bureau of Economic and Business Research provides and analyzes a variety of state and local economic data. The college has acquired several financial data files such as the Chicago Research on Stock Prices (CRSP) and the Standard and Poor's Compustat Tapes. There are also economic data tapes, including Data Resources and International Monetary Fund tapes. The college is the depository for the Bureau of Economic Analysis tapes and diskettes.

Another important aspect of the college's overall teaching and research program is the international orientation of many programs. Distinguished faculty members with international academic backgrounds have developed a number of special courses with an international focus. The Office of the Coordinator of International Programs in the college provides overall assistance in the international field. The Center for International Education and Research in Accounting in the Department of Accountancy coordinates the research programs of distinguished visiting scholars and publishes an international accounting journal. The college is involved in several overseas international programs, including programs in Bangladesh, Saudi Arabia, the Sudan, and elsewhere. A Program in Policy Economics has been started in the Department of Economics for people from developing countries, and the Department of Business Administration offers a

unique fourteen-month Master of Science in Business Administration for International Managers.

The Office of Real Estate Research, funded by the State of Illinois Real Estate Recovery Fund, undertakes and fosters research related to real estate in Illinois, communicates the results of such research to the real estate industry, and promotes the ongoing development of real estate education.

Additional research offices have been created in the college: the Office of Public Utility Research; the Office of Accounting Research; and the Office of Business Innovation and Entrepreneurship. Each of these offices promotes and coordinates research of faculty members in the college in these specific areas. In addition, each office provides a focal point for the college and its various constituencies to discuss and disseminate research results. These offices are funded by a combination of government and private-industry support.

The Survey Research Laboratory is widely used by faculty and students interested in survey work. The Behavioral Laboratories are used to perform a variety of behavioral experiments, and the computer is a major tool for hypothesis testing and programming.

COMMUNICATIONS

In the College of Communications, the Institute of Communications Research, which administers the doctoral program in communications, is one of the oldest and most distinguished interdisciplinary research centers in the United States. Through its graduates, the institute has spawned many similar programs and institutes around the country. It conducts research and teaches in virtually all areas of communication but concentrates on cultural and media studies, the political economy of communications, the effects of mass communication, attitude and opinion change, and the psychology and sociology of language. It provides students the opportunity to study and to conduct research with a faculty that combines such disciplines as political science, sociology, psychology, and linguistics with the professional fields of advertising, broadcasting, and journalism. The University broadcasting division, which operates WILL-AM-FM-TV, provides equipment and studios for broadcast instruction. The college also maintains laboratories for audio production, typography, and photography. Holdings in the Communication Library in Gregory Hall are widely regarded as among the best in the nation.

EDUCATION

The College of Education is recognized worldwide for the excellence and leadership of its faculty, graduate programs, and alumni. During the past decade, the college has consistently been rated among the top five colleges of education in the nation. Its faculty members have served as executive officers of nearly every professional education organization and also have held editorial and review positions on most educational journals. Seven major professional journals are currently published under the auspices of the college. Typically, more than 40 percent of the college's budget results from externally funded research.

College alumni are found in faculty and administration positions in the leading colleges of education throughout the world. Alumni hold numerous leadership positions in government education agencies and school districts.

Graduate programs are offered in all of the academic departments: Administration, Higher, and Continuing Education; Curriculum and Instruction; Educational

Policy Studies; Educational Psychology; Special Education; and Vocational and Technical Education.

The Department of Administration, Higher, and Continuing Education has three divisions that offer research and professional programs with humanistic and social-science foundations and theoretical and practical perspectives. The Division of Educational Administration and Supervision emphasizes scholarship and research in areas such as school law, the supervision and evaluation of instruction, school finance, the politics of education, the nature of school excellence, and administrative theory. The Division of Higher Education prepares degree candidates for administrative positions in community and senior colleges, universities, and related agencies. It provides specializations in the administration of higher education, student development, student affairs, and the history of higher education. Persons enrolled in the Division of Continuing Education are prepared for administrative positions in a variety of continuing-education agencies concerned with professional development.

The Department of Curriculum and Instruction reflects the movement of the College of Education toward enhancing the professional standing of teaching and of the education profession. Graduate degree programs are designed to meet the individual needs of college graduates who are prospective or experienced teachers, administrators, researchers in teacher education, and consultants working in the field of education. Programs are offered in the following areas of specialization: curriculum, early childhood education, elementary education, instruction, instructional technology, language and literacy education, mathematics education, science education, social studies education, secondary education, and teacher education. A joint program with the School of Music leading to an EdD in Music Education is also offered. Graduates of these programs are employed in schools, colleges, universities, and state and federal educational agencies.

The Department of Educational Psychology serves two primary interrelated functions. The first is to promote both basic and action-oriented research on questions related to broadly used educational practices and policies. The second is to train practitioners; this includes in-service and preservice instruction and consultation. Graduate degrees are offered in areas covered by its five divisions: counseling psychology, developmental and socialization processes, learning and instruction, quantitative and evaluative research methodologies, and sociocultural perspectives in education. A master's degree can be earned in a general educational psychology program as well. The PhD program in counseling psychology has the approval of the American Psychological Association. The department has a national and an international reputation as a research and educational center.

The Department of Educational Policy Studies offers programs in the history of education, the philosophy of education, comparative education and social science, educational policy analysis, and educational aesthetics. The programs provide a basis for the analysis and evaluation of educational theory, practice, and policy within the intellectual and empirical contexts of history, philosophy, and the social sciences. The department offers programs for training scholars, teachers, and educational policy analysts.

The Department of Special Education offers graduate programs to prepare teachers, supervisors, and administrators of special education for exceptional children, youth, and adults in public and private agencies. At the doctoral level, leadership personnel are prepared for teacher education, research, and administrative positions in university settings and local, state, or national agencies serving disabled or gifted individuals. Its programs include moderate and severe handicaps training, infancy/early childhood, interdisciplinary leadership in infancy, and the administration and supervision of special education.

The Department of Vocational and Technical Education seeks (1) to prepare effective leaders who will educate and help develop productive and socially competent citizen-workers and (2) to enhance individual and social well-being through research, instruction, and service that examine the nexus of education, work technology, and family. Students are from both school and nonschool settings and acquire the expertise needed to be effective instructors, trainers, human-resource development specialists, administrators, program leaders, and researchers. Programs are offered in agricultural education, business education, general vocation/technical education (e.g., training and development of special populations), home economics education, and technology education.

In addition to research conducted principally within academic departments, the following units, with specialized research interests, are supported by the college: the Bureau of Educational Research, the Center for Instructional Research and Curriculum Evaluation, the Center for the Study of Reading, the Office of Educational Policy Research, the Office of International Programs in Education, the Office of Career Development for Special Populations, the Office of Vocational Education Research, the National Center for Research in Vocational Education/University of Illinois Office, and the Secondary Transitional Intervention Effectiveness Institute. Most of these units offer assistantships or fellowships to qualified doctoral students.

ENGINEERING

The College of Engineering was one of the original units of the University when it was founded in 1867 and is recognized as a major international center of excellence in graduate education in scope, quality, and productivity. In overall quality, the college has been among the top four in the nation in all surveys of recent years. The College of Engineering leads the nation in total degrees conferred at all degree levels; in recent years, one out of every twenty PhD graduates in engineering received his or her degree from the University of Illinois at Urbana-Champaign.

The college's Engineering Experiment Station, organized in 1903 as the first of its kind, had separately budgeted research expenditures in the 1988 fiscal year of $75.5 million. Special laboratories and unusual facilities include the EpiCenter, with a seven-port molecular beam epitaxy machine, and the new Microelectronics Laboratory, with equipment for plasma-assisted deposition, reactive ion and plasma etching, and E-beam lithography. An impressive collection of instruments is available in the Center for Microanalysis of Materials, including that for Auger, x-ray photoemission, and secondary ion-mass spectroscopy. Also available are a nuclear reactor, radio and optical telescopes, an AVCO HPL-10 20-kW industrial laser, and an 80-kW plasma spray unit.

University computer services are provided by a number of general-purpose computers: a Convex C220, IBM 3081 and 4341, a Gould, two Sequents, three Pyramids, and several VAX 11/780s. In addition to these central facilities, there are thousands of personal computers and a number of minicomputers and mainframes supported by individual departments. The college also operates an IBM 4381 for CAD/CAM applications. This vast array of computing resources is supported by a hierarchical network consisting in part of a large (2000 port) asynchronous terminal network and an optical-fiber, token-ring backbone network. The college's twenty-three major buildings are on a network that gives faculty and students access to all central computing facilities, to the 110 attached

local area networks, and to a number of regional and national networks such as ARPAnet, BITnet, and NSFnet.

The Engineering Library holds 180,000 volumes and more than 3,600 periodical subscriptions. The remainder of its 350,000-volume collection is found in other campus locations. The Engineering Library is supplemented by departmental libraries, including mathematics, physics, chemistry, and geology.

The departments of the college offer graduate degree programs in the following engineering fields: aeronautical and astronautical, ceramic, civil and environmental, electrical and computer, general, mechanical and industrial, metallurgical, and nuclear; as well as in computer science, materials science, physics, and theoretical and applied mechanics. Among the interdisciplinary specialties are bioengineering, engineering design, environmental control, and materials engineering. The Materials Engineering Research Laboratory is an interdisciplinary laboratory with extensive equipment for the characterization of the mechanical behavior of materials.

The college maintains three major interdisciplinary research laboratories: the Coordinated Science Laboratory (CSL), the Materials Research Laboratory (MRL), and the Microelectronics Laboratory. CSL provides an interdisciplinary research environment for faculty and students from engineering and other disciplines. The research concentrates on such areas as computer systems, communications, VLSI circuits, artificial intelligence, signal processing, and robotics. MRL, with one of the country's outstanding facilities for electron microscopy and microanalysis of materials, supports research and education in the materials sciences in cooperation with a number of engineering and scientific disciplines; multidisciplinary research basic to an understanding of the solid state of matter is stressed. The Microelectronics Laboratory is a multidisciplinary facility for investigating new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors.

The college has six major federally funded centers: the U.S. Environmental Protection Agency–sponsored Advanced Environmental Control Technology Research Center; the National Science Foundation–funded Engineering Research Center for Compound Semiconductor Microelectronics; two NSF Science and Technology Centers (cement-based materials and superconductivity); and four centers (composite materials, construction technology, cement composite materials, and supercomputing environments) funded by the Department of Defense under its University Research initiatives program.

The campus's two supercomputing centers, while special units of the Graduate College, have a close association with the College of Engineering. The Center for Supercomputing Research and Development is involved with advancing the state of supercomputing in three areas: engineering and architecture, software, and algorithms and applications. The National Center for Supercomputing Applications is one of the premier national centers created by the National Science Foundation in 1984 to provide supercomputers in major U.S. research universities. (See previous discussion on National Center for Supercomputing Applications.)

FINE AND APPLIED ARTS

The College of Fine and Applied Arts includes the Schools of Art and Design, Architecture, and Music as well as the Departments of Dance, Landscape Architecture, Theatre, and Urban and Regional Planning. The excellent facilities include the Krannert Center for the Performing Arts, the Krannert Art Museum, practice rooms, studios, laboratories, exhibition spaces, and specialized libraries.

The Krannert Center for the Performing Arts provides studio space for classes in theatre, dance, and music; graduate students participate in many of the public performances in its four theatres as well as in other theatres on campus. Music students use the rehearsal rooms, studios, and auditoriums in Smith Music Hall and in the Music Building. The work of students receiving MFA degrees in the School of Art and Design is exhibited in the Krannert Art Museum, which is connected to the Art and Design Building. Students in the School of Architecture exhibit their work in the Temple Buell Architecture Gallery.

Throughout the year, many visiting artists, performers, and speakers come to the campus, brought by the college and its departments. Comprehensive libraries in art and architecture, city planning and landscape architecture, and music serve students and faculty.

LAW

The College of Law was established in 1897 and is one of the oldest and most renowned law schools in the nation. The members of the law faculty are graduates of leading law schools and are active in both legal research and public service, and work closely with graduate students, both in and out of the classroom.

The College of Law offers three graduate degrees: the Master of Law (LLM), the Master of Comparative Law (MCL), and the Doctor of the Science of Law (JSD). For graduate lawyers from the U.S. and countries whose legal system is based on the common law, the emphasis of the graduate program is to provide advanced training and research opportunities relevant to a career in teaching. For advanced degree candidates whose basic law training was taken in a civil law jurisdiction, the basic purpose of the program is to provide a well-rounded background in the methodology and structure of the U.S. legal system. The course offerings and the general organization of the graduate program are particularly suitable for candidates with a professional interest in the field of international business law.

LIBERAL ARTS AND SCIENCES

The College of Liberal Arts and Sciences (LAS) is the largest college within a university setting in the state of Illinois. The college provides instruction in a diverse set of fields that encompass most of the traditional disciplines in the liberal arts and sciences. The thirty-eight degree-granting departments and programs in the college offer a total of seventy undergraduate, sixty master's, and thirty-six doctoral degree programs. The graduate instructional programs of the individual departments and units of the college are discussed in the Programs of Study section of this catalog.

The units providing graduate instruction and graduate degrees in the college are listed below:

School of Chemical Sciences
Department of Biochemistry
Department of Chemical Engineering
Department of Chemistry

School of Life Sciences
Department of Cell and Structural Biology
Department of Ecology, Ethology, and Evolution
Department of Entomology

Department of Microbiology
Department of Physiology and Biophysics
Department of Plant Biology

Other Department and Units
Center for African Studies
Department of Anthropology
Department of Astronomy
Department of the Classics
Program in Comparative Literature
Center for East Asian and Pacific Studies
Department of English
Division of English as an International Language
Department of French
Department of Geography
Department of Geology
Department of Germanic Languages and Literatures
Department of History
Center for Latin American and Caribbean Studies
Department of Linguistics
Department of Mathematics
Department of Philosophy
Department of Political Science
Department of Psychology
Center for Russian and East European Studies
Department of Slavic Languages and Literatures
Department of Sociology
Department of Spanish, Italian, and Portuguese
Department of Speech and Hearing Science
Department of Speech Communication
Department of Statistics

Most of these units have prepared brochures and materials describing, in greater detail than is possible here, the resources and facilities available for graduate students who are pursuing graduate instruction and research. The reader should contact the unit in which he or she is interested to obtain further information. The following is a brief description of the major kinds of resources and facilities available to students in units of the college. The specific resources described are only examples of those available in each category.

School and Departmental Libraries

A number of units in the college have exceptional departmental libraries conveniently located near the units. In particular, the libraries in chemistry, life sciences, and mathematics are exceptional. A number of the collections for the humanities and social sciences are outstanding, for example, the Slavic collection, the Asian Library, and the map and geography library. (See page 7.)

Museums and Collections

The Herbarium, administered by the School of Life Sciences, is the tenth largest herbarium at an American university. It is both a research and teaching facility, and its staff serves the public by assisting in the identification of plants.

The Museum of Natural History has served graduate students and faculty members since the 1870s. A number of special collections, including reptiles, amphibians, mammals, and shells from all parts of the world, are housed in the museum. Research specimens for advanced scientific study number more than 400,000.

Two collections of special note in the humanities are the American Center of the International Photographic Archive of Papyri and the Cinema Studies Film Archive.

The World Heritage Museum houses more than 25,000 artifacts that illustrate cultural achievements from prehistoric Europe; ancient Mesopotamia, Egypt, Greece, and Rome; northern Europe; Africa; the Orient; and America. The museum's collections are heavily used by University classes in history, art history, classics, and anthropology for general tours and individual research projects.

Clinical and Training Facilities

The Department of Psychology operates the Psychological Services Center, which is the principal facility for training and research in clinical psychology. The Department of Speech and Hearing Science operates three clinics (speech, language, and hearing) to provide training for its students. The Department of Astronomy, in conjunction with San Diego State University, operates a one-meter optical telescope at Mt. Laguna in California for training and research purposes; in addition, the department arranges observation time for students on both optical and radio telescopes at other sites.

Laboratories

All of the units in the life sciences, the physical sciences, psychology, and speech and hearing science have extensive laboratory facilities. Of particular note are the facilities of the School of Chemical Sciences. In addition, there are two outstanding laboratories in the humanities and social sciences: the Language Learning Laboratory and the Spatial Data Analysis Laboratory in the Department of Geography.

The technical facilities of the School of Chemical Sciences include molecular spectroscopy, mass spectroscopy, and laser spectroscopy laboratories; a radioisotope laboratory; a computer center; a microanalytical laboratory; hydrogenation and high-pressure facilities; and machine, electronic, electrical, and glass-blowing shops.

The Language Learning Laboratory (LLL), in addition to providing teaching facilities, promotes research in language learning and teaching. Advanced technological resources, including PLATO, CYBER, microcomputers, and television production facilities are available for the LLL.

The Spatial Data Analysis Laboratory, which is administered by the Department of Geography, is responsible for developing and improving research and instruction related to the acquisition, analysis, and display of spatial data. Technical service facilities (including electronic coordinate digitizers, computer terminals, graphics terminals, darkroom photo-processing facilities, and a remote sensing and air photo laboratory) are available.

Quantitative Services

There are special computing resources available in many departments in the college; in addition, all units on campus have access to the Computing Services Office (see page 11). For example, the Department of Astronomy has direct access to the VAX 11/780 computer, shared with three other units on campus.

The National Center for Supercomputing Applications has a CRAY X/MP 24, the fastest commercially available supercomputer, in operation. The center provides access to the CRAY to researchers from a wide range of fields. Several of the scientists in the center also work with students. A detailed description of the center may be found in the Graduate Research and Instructional Resources section.

The Department of Statistics, through the Mathematical and Statistical Consulting Committee, provides a consulting service to faculty and graduate students from all areas of the University. The service provides assistance in design and analysis of various statistical projects.

Interdisciplinary Research Efforts

Units in the college participate in a number of campuswide interdisciplinary efforts, many of which are described elsewhere in this catalog. Some of the instructional units in the college are by nature interdisciplinary. The area studies centers (African Studies, East Asian and Pacific Studies, Latin American and Caribbean Studies, and Russian and East European Studies) are examples of these; their degree programs are described in the Programs of Study section. There are two other special units: the Unit for Cinema Studies and the Unit for Criticism and Interpretive Theory.

The Unit for Cinema Studies promotes and coordinates the critical and historical study of the cinema. Its membership represents several departments and reflects a variety of critical and scholarly interests. The unit is also a resource center that promotes cinema teaching and scholarship through its growing archive of film materials and its editorial and analytical equipment for film study.

The Unit for Criticism and Interpretive Theory, an interdisciplinary program drawing upon fifteen humanities and social science departments, promotes a broad range of teaching, research, and related scholarly activities. For MA and PhD degree students in participating departments, the unit offers a formal program leading to advanced certification in criticism and interpretive theory.

There are a number of other groups (some informal) of faculty and students working together on interdisciplinary studies. Examples of these are the Afro-American Academic and Research Program; the Program in Arms Control, Disarmament, and International Security; the Science, Technology, and Society Program; the Southwest Asia Studies Program; and the Office of Women's Studies.

Scholarly Journals

A number of major scholarly journals are edited in units within the college; among these are *Illinois Classical Studies, Journal of English and Germanic Philology,* and *Illinois Journal of Mathematics.*

Placement Services

All departments and schools assist their students in seeking placement. In some cases, resources in schools or departments are pooled; the Schools of Chemical Sciences and Life Sciences and the Department of Mathematics have each organized central placement services. Other units have their own placement programs

or assist students individually. The Liberal Arts and Sciences humanities departments also sponsor graduate advising interns in the Campus Career Services Center to assist undergraduates.

VETERINARY MEDICINE

The graduate programs in the College of Veterinary Medicine emphasize research training involving animal health, pharmacology, infectious and metabolic diseases, pathology, toxicology, zoonotic diseases, reproductive physiology, public health, neurobiology, biotechnology, comparative medicine, and bone/cartilage studies. The college has new, modern clinical and basic sciences facilities for graduate study and research ranging from basic biotechnology to applied clinical and field studies under controlled confinement and natural environmental conditions. Major emphasis is being placed on graduate training in biotechnology. Interdisciplinary research is ongoing with other colleges on the Urbana-Champaign campus and at the Dixon Springs Agricultural Center in southern Illinois. The college's association with the Illinois State Department of Agriculture, Department of Public Health, and Department of Conservation provides opportunities to use field facilities for appropriate research projects. The college is a member of an interuniversity consortium that will facilitate graduate education.

Resources, Facilities, and Services

CULTURAL RESOURCES

The University of Illinois at Urbana-Champaign is a major cultural center. Among its arts facilities is the Krannert Center for the Performing Arts, which was designed by alumnus Max Abramovitz, architect of New York City's Lincoln Center. The Krannert Center has four theatres and is a magnificent showcase for music, theatre, opera, and dance. It also has an open air amphitheater and five major rehearsal rooms that are used by students in professional training programs in the performing arts. More than 350 public performances are presented there each year. Internationally known performers are brought to the campus to augment the offerings of the Departments of Theatre and Dance and the School of Music.

The Krannert Art Museum has a full schedule of exhibitions, from its own collection as well as traveling exhibitions. The World Heritage Museum, which houses collections of artifacts from cities and civilizations from all parts of the world; the Museum of Natural History, which has displays on early man, flowering and nonflowering fossil plants, animal exhibits, and more than 400,000 research specimens; and the John Philip Sousa Museum and Library are used for research, teaching, and enjoyment. Student work in architecture and related areas is exhibited in the Temple Buell Gallery. The Japan House provides members of the campus community an opportunity to experience the teaching of Japanese arts in a realistic environment.

Distinguished public figures and outstanding scholars appear regularly on campus for symposia, lectures, forums, and public discussions.

WILL-TV and WILL-AM-FM radio stations, all affiliated with the Public Broadcasting Service, provide a wide range of cultural programs to a large area of the state.

The Illini Union, the campus social center, contains cafeteria and dining facilities, guest rooms, art galleries, reading and television rooms, billiards and electronic-game rooms, bowling lanes, a ticket and check-cashing counter, alumni offices, and a paperback bookstore. Special events are scheduled throughout the year. The Illini Union Gallery provides exhibits of a broad range of contemporary art and craft objects.

Many concerts are given in the Music Building and Smith Music Hall, and films are shown on campus throughout the year. Students direct, produce, and act in plays presented at the Armory Free Theatre.

RECREATIONAL FACILITIES

The University of Illinois is the home of one of the top collegiate recreational sports programs in the nation, the Division of Campus Recreation (DCR). All sectors of the University can participate in the multifaceted recreation programs sponsored by the division.

Recreational programs and services include excellent multipurpose facilities, special events, outdoor recreation, sports clubs, intramurals, exercise and fitness programs, Ice Arena activities, and student leadership and employment opportunities.

One of the most popular recreational areas on campus is the Intramural–Physical Education (IMPE) Building on Peabody Drive. This facility contains gymnasiums, indoor and outdoor swimming pools, handball/racquetball and squash courts, and outdoor tennis courts. There are also weight-training rooms, exercise rooms, an archery range, a camping equipment and resource room, a games room, combatives rooms, and offices.

The newly renovated and remodeled Ice Arena, 406 East Armory, is open year-round for various activities, including skating, hockey, broomball, skating lessons, and parties.

Throughout the year, DCR offers diverse programs to appeal to a wide range of interests. These special events include Quad Day, Sports Trivia Bowl, poolside concerts, and activities for children living in Orchard Downs.

Exercise and fitness programs sponsored by DCR include aerobics classes; water exercise; low-impact aerobics classes; and the Illini Century Club for self-paced wheelchair pushers, joggers, swimmers, and cyclists. Several wellness clinics are also offered throughout the year.

More than forty different sports clubs provide a variety of activities for students, ranging from martial arts and scuba to rugby and ice hockey. Team and individual sports competition, practice sessions, and tournaments with other universities are possible.

The outdoor recreation program offers opportunities for students to rent camping and sports equipment, including tents, backpacks, and skis. Several outdoor clinics, weekend workshops, and extended trips to such areas as the Grand Canyon and the Florida Everglades are scheduled during the year.

Approximately forty activities are available to students in the organized intramural sports program. Students can participate in men's, women's, corecreational, and graduate/faculty/staff divisions in sports ranging from flag football, soccer, and basketball to tennis, swimming, and wrestling. Novel sports such as inner-tube water polo, ultimate frisbee, broomball, and wallyball have many enthusiastic participants.

Students may apply for part-time employment and volunteer leadership opportunities at DCR. Each year more than 400 students work as intramural sports officials and supervisors, lifeguards, receptionists, designers, aerobic instructors, first-aid supervisors, building supervisors, and intramural managers.

GRADUATE STUDENT ADVISORY COUNCIL (GSAC)

The Graduate Student Advisory Council communicates the concerns of graduate students to the dean and staff of the Graduate College. Responding to the changing needs of graduate students, GSAC identifies and clarifies the issues and makes recommendations to the Graduate College. GSAC is composed of fifteen appointed graduate students, representing the range of graduate programs at the University of Illinois at Urbana-Champaign.

INTERNATIONAL PROGRAMS AND STUDIES

The University of Illinois at Urbana-Champaign offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate study and research often form an integral part of University programs with foreign institutions. Research opportunities are available through many departments, the Graduate College, the Center for African Studies, the Center for

East Asian and Pacific Studies, the Center for Latin American and Caribbean Studies, the Center for Russian and East Europeans Studies, and the Program in South and West Asian Studies.

For full information on these opportunities, as well as other graduate study-abroad programs and a wide range of courses and seminars in international studies, write for the handbook *International Programs and Activities*, obtainable from International Programs and Studies, 324 Coble Hall, 801 South Wright Street, Champaign, IL 61820, or contact the appropriate college or department.

In addition, overseas teaching opportunities are often available in music education, English as an international language, and some of the modern language departments. Interested students should consult the executive officer of the appropriate department or division.

CIC TRAVELING SCHOLAR PROGRAM

The Committee on Institutional Cooperation (CIC), a consortium of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to attend other CIC institutions in order to take advantage of special course offerings, laboratory facilities, or library collections. Visits of traveling scholars are limited to two semesters or three quarters. Traveling scholars register and pay regular fees at their home universities. Credit earned while in this program is automatically accepted by the home university.

Application forms are available from the Records Office, Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820.

REHABILITATION EDUCATION SERVICES

Since 1947 the University of Illinois at Urbana-Champaign has pioneered in facilitating the education of students with disabilities. Campus facilities are among the best in the nation, and applications from persons with disabilities are welcomed. The Division of Rehabilitation Education Services in the College of Applied Life Studies is responsible for planning campus facilities to ensure that all are accessible to and usable by the physically disabled and provides a variety of services and opportunities to students with disabilities. These include early registration privileges, housing arrangements, transportation, prosthetic repair, physical therapy and functional training, medical services, counseling services, recreation and athletics, and services to the visually and hearing impaired. For information about graduate education and degree programs in rehabilitation education, with areas of concentration in counseling and administration, applicants are encouraged to contact the director of the division at the Rehabilitation Education Center, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, IL 61820, (217) 333-4600, for further information.

Since some graduate programs require a variety of physical skills, prospective students with permanent disabilities are strongly encouraged to communicate with the division to ascertain how their particular program can be implemented. The division works closely with academic units to establish the manner in which degree requirements can be met.

HOUSING

The University of Illinois maintains housing for single graduate students in two residence halls within walking distance of the campus. Each study room is furnished and connects with a complete bath shared with the residents of one or two other rooms. Single and double rooms are available. Cooking is not allowed in student rooms, but a contract for food service in nearby dining rooms can be arranged. Residence halls have lounge facilities, laundry rooms, and vending machines.

Students must be admitted before they can sign a housing contract. Priority in assignment is determined by the date that the completed contract is received. Students should make housing arrangements well in advance of the start of the term. For information, write to the Residence Hall Contracts Office, 200 Clark Hall, 1203 South Fourth Street, Champaign, IL 61820.

Married students and students with families can choose from one-bedroom (furnished) or two-bedroom (furnished or unfurnished) apartments. All units include a stove and a refrigerator. Convenient laundry facilities are available. For information, write to the Family Housing Office, 1841 Orchard Place, Urbana, IL 61801.

The Housing Information Office also maintains a current listing of privately owned apartments and rooms available in the community. Students seeking private housing are urged to visit the campus as early as possible since all arrangements for this type of accommodation should be made in person. Anyone unfamiliar with standard leasing practices should ask a housing consultant for assistance. The Housing Information Office, University of Illinois at Urbana-Champaign, is located at 2 Turner Student Services Building, 610 East John Street, Champaign, IL 61820, telephone (217) 333-1420.

The University of Illinois at Urbana-Champaign and the University residence halls are committed to a policy of nondiscrimination with respect to race, color, national origin, ancestry, religion, sex, marital status, sexual orientation, age, handicap, unfavorable discharge from the military, or status as a disabled veteran or veteran of the Vietnam era.

HEALTH SERVICE AND INSURANCE

Students enrolled in credit courses and in attendance on the Urbana-Champaign campus are assessed separate fees that cover health service at the McKinley Health Center and group health insurance.

Health Service

The health service fee supports the medical services available on campus at the McKinley Health Center. These services include 1) the diagnosis, treatment, and follow-up of acute and chronic illnesses, 2) a twenty-four–hour "dial-a-nurse" to advise on appropriate treatment and referral to local hospitals, 3) gynecology services, 4) preventive medicine, 5) mental health care, and 6) health education. In addition, a wide range of diagnostic tests are available, including laboratory procedures and radiologic examinations. A pharmacy provides most medications at no cost to students when they are prescribed by a McKinley Health Center physician.

All of these services are available at no additional cost to students who have paid the health service fee. Dependents are not eligible for care at the health center unless they are also enrolled students at the Urbana-Champaign campus. McKin-

ley Health Center is fully accredited as an ambulatory health-care facility by the Joint Commission on Accreditation of Healthcare Organizations.

Group Health Insurance

The University insurance plan provides worldwide hospital/medical/surgical coverage (up to $150,000) for the insured student and the choice of any legally qualified hospital or licensed physician. It also includes a $3,000 accidental death and dismemberment benefit. The coverage is provided on a term basis and includes all holidays in the term, as well as the period between terms. Brochures that describe the University insurance plan in detail are available at registration and at the Student Insurance Office.

An insured student who wishes to extend health insurance coverage to his or her spouse and/or children may do so. Students enrolled for the spring semester who do not plan to attend the summer session may elect to extend their insurance for the entire summer vacation period by applying and paying the insurance premium to the Student Insurance Office.

Insured students may extend coverage for themselves and their dependents following graduation or withdrawal from school. This must be done before they leave campus; it cannot be done by mail. The Student Insurance Office will provide information on procedures.

Students who present evidence of continuing equivalent medical insurance coverage may be exempted from paying the fee for the University insurance, if they submit a petition to the Student Insurance Office during the period provided for the exemption of fees, and it is approved. Once the student is declared exempt, the exemption is continuous.

Students may request that they be reinstated at any time during a term; however, reentry into the insurance program is subject to approval of a medical history. If approved, coverage is effective on the date of the application. There is no prorated premium.

Requirements and Procedures

ADMISSION AND REGISTRATION

General Requirements

Applicants who have graduated from an accredited college or university, or who hold or will be granted by the end of the current academic year a baccalaureate degree (or its equivalent) comparable in content and in number of credit hours to that granted by the University of Illinois at Urbana-Champaign, can apply for admission to the Graduate College of UIUC. Applicants must have an admission average of at least 4.0 (A = 5.0) computed from the last 60 hours of undergraduate work and any graduate work completed. Meeting these minimum admission requirements of the Graduate College, however, does not guarantee admission; individual departments may set a minimum grade-point average higher than that of the Graduate College and may impose other special admission requirements and conditions. Because applicants to most departments compete for a limited number of positions, many who exceed minimum requirements may be denied admission.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses that have a bearing on the student's field of specialization should submit a written evaluation or a letter grade by the instructor in each such course, along with scores on the Graduate Record Examination. Because some departments have special examination requirements, applicants should check with their prospective departments; for example, accountancy and business administration use the Graduate Management Admission Test instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in November or December for the summer session and fall semester, and September or October for the spring semester. Applications will not be accepted during the three weeks preceding the beginning of a term.

Application forms may be obtained from the major department or the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820. A nonrefundable application fee must accompany the application.

International applicants must submit official records of all higher education, including certificates of degrees with the dates the degrees were conferred. If only one original is available and would be difficult to replace, an attested or certified copy should be submitted. All records not in English must be accompanied by a translated record. Records should show the individual subjects studied and the grades received in each subject.

International applicants are required to submit proof of adequate finances for the entire period of planned study. Applicants unable to provide satisfactory evidence of adequate finances will not be granted admission.

Eligible applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) given several times a year throughout the world. Applicants should make arrangements directly with the Educational Testing Service, Box 899, Princeton, NJ 08541, U.S.A. Graduate applicants are exempt

from this testing if, within five years of the proposed date of enrollment at UIUC, they have completed at least two academic years of full-time study in a country where English is the primary language and in a school where English is the primary language of instruction.

The University requires a score of at least 520 on the TOEFL examination, and some departments require higher scores. All non-native, English-speaking applicants to the Graduate College who are admitted on the basis of their academic credentials but score below 590 on the TOEFL or fail to submit a required TOEFL score, will be admitted on limited status and required to take the English Placement Test (EPT) upon their arrival.

The Notice of Admission

Each applicant who is recommended for admission by a graduate department and who is determined to be eligible by the Office of Admissions and Records or the Graduate College will be issued a Notice of Admission for the term that he or she desires to enter. The Notice of Admission is official verification that admission has been approved for a specific term and should be brought to the initial registration.

An applicant who, either before or after admission is approved, wishes to change the designated term of entry usually must submit another application (and include an additional processing fee) unless his or her major department is willing to request that this requirement be waived. Such requests will be considered by the Office of Admissions and Records provided that the newly desired term is within one year of the term of entry originally requested. Applicants should note that a Notice of Admission issued for the summer term, if not marked "Summers Only," is valid for the following fall semester, and that a Notice of Admission for the fall term is also valid for the preceding summer session.

The Notice of Admission will specify the admission status of the student: whether the admission is as a degree candidate or as a nondegree student, whether full graduate standing or limited status has been approved, and whether additional credentials are still needed. Each admitted student must submit complete academic credentials to the Office of Admissions and Records before the registration period for the student's second term of attendance. Registration for the second term will be encumbered if the required official transcripts have not been received.

The Notice of Admission may state specific conditions for admission. Admitted students should have a clear understanding of the conditions or should seek clarification from their major departments. A student may be admitted on limited status if his or her preadmission grade-point average (GPA), which is based on the last 60 semester hours of undergraduate work, is below the Graduate College minimum of 4.0 (A = 5.0), or if the academic record shows other deficiencies or nontraditional academic qualifications. After the student has satisfied the conditions imposed, his or her major department should request that the Graduate College change the student from limited status to full graduate standing. No advanced degree will be awarded to a student who has not qualified for, and been granted, full graduate standing.

Enrollment Patterns

Each student admitted can choose one of two enrollment patterns: *continuous*—the student must enroll each fall and spring semester, with summer sessions optional or *consecutive summers only*—the student enrolls only for summer sessions. Once an option has been chosen and is established by enrollment, the pattern may not

be broken unless the Graduate College approves a leave of absence or the Office of Admissions and Records gives permission to change the enrollment pattern. Graduate students who break their patterns of enrollment without prior approval must apply for readmission in order to resume their studies. However, a student applying for readmission to a graduate degree program in which he or she was enrolled within the previous five years is not required to pay the application fee.

Nondegree Status

Students with nondegree status are admitted to courses on a part-time basis if there is enough space. Once accepted for admission by a department and the Graduate College, a nondegree student has the same enrollment pattern options as a degree candidate. Either the major department or the Graduate College, however, may discontinue the nondegree status at the end of any term. A nondegree student need not apply for admission as long as he or she maintains one of the established patterns of enrollment.

There are several restrictions and conditions that apply to nondegree status. Nondegree students:

a. Are not eligible to advance enroll.
b. Cannot register until after the third day of classes in the fall or spring semester. The late registration fee will be waived if the student completes his or her registration on or before the tenth day of instruction in a semester.
c. Are required to have approval each term from both their home department and the department offering the course in which they wish to enroll. Admission does not guarantee, therefore, that the student will be able to enroll in all courses desired.
d. Are limited to taking fewer than 3 units per semester. A nondegree student will not be granted full-time status unless he or she is participating in a special program for which full-time approval has been obtained from the Graduate College prior to admission.
e. Are not eligible for financial aid administered by the Graduate College.
f. Must apply for readmission if they wish to become candidates for a degree. If the student is later approved for degree status, a maximum of 3 units of nondegree credit may be applied to a degree.

A nondegree student who wishes to enroll only during the summer sessions need not be admitted by a specific department but may carry an unassigned student status with the Graduate College. Certification of an earned degree is all that is required for admission. Such a student is allowed to register continuously from summer to summer until his or her pattern of enrollment is broken.

Registration

Currently enrolled degree students should advance enroll for the following semester and complete their registration by mail. New and other students who have not advance enrolled should meet with their advisers and complete their schedules before going through on-campus registration. Students who advance enroll are more likely to gain entry into the classes they desire.

Because course descriptions found in the *Courses* catalog are sometimes incomplete or outdated, students should check with their department's graduate studies office or talk with instructors involved to find out about reading lists, papers, projects, and examinations for particular classes.

On-campus registration occurs during the week preceding the start of instruction in a semester. At this time, students who are not advance enrolled or encumbered and students who are advance-enrolled but who need to make class schedule changes complete their registration. Students who have not enrolled in advance or who need to make class schedule changes must meet with their advisers and make up their schedules before going through registration. Instructions on how to get through the registration process are printed each semester and are available in all departmental offices and in the Graduate Records Office.

There is a fee for late registration. If, however, failure to complete registration during the regular period is in some way the fault of the University or if there are extenuating circumstances such as severe illness or hospitalization, a student may petition the Records Office of the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, IL 61801, for a waiver of the fee.

IMMUNIZATION POLICY

The University, in accordance with Illinois state law, requires that all new or reentering students who have been absent one or more semesters must show proof of immunity to measles, mumps, rubella, diphtheria, and tetanus. The University requires proof that entering students are immune to poliomyelitis as well. Students who are not properly immunized, in accord with Illinois public health law, must be immunized within the semester they arrive on campus or must present medical or religious reasons for noncompliance. Until they satisfy the immunization requirements, these students will not be allowed to register for subsequent semesters.

TUBERCULOSIS CONTROL

All new, transfer, and readmitted students are encouraged to present evidence of freedom from tuberculosis at the University's McKinley Health Center. Proof of freedom from tuberculosis is necessary for some students, such as new teaching assistants and those who have jobs handling food. All new international students are required to complete tuberculosis screening at McKinley Health Center before finishing registration. Final evidence of freedom from tuberculosis is established by presenting a University of Illinois or public health agency certificate dated within the previous twelve months or by undergoing a tuberculin skin test at the McKinley Health Center that is read negatively at the Health Center within forty-eight to seventy-two hours later.

TUITION AND FEES

Since tuition and fees are subject to change, it is difficult to provide exact information. Tuition and fees are assessed on the basis of a student's status (resident or nonresident of Illinois), college of enrollment, and the number of credit hours taken each term. In computing fees, 1 unit is equivalent to 4 semester hours. A complete schedule of fees and an explanation of the eligibility requirements for full or partial exemption are available from the Tuition and Fee Assessment Section, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, IL 61801.

Residence for Tuition Assessment

Tuition is assessed on the basis of whether a student is a resident or nonresident of the state of Illinois in accordance with the *University of Illinois Regulations Governing the Determination of Residence for Admissions and Assessment of Student Tuition.* These regulations are published in the *Code on Campus Affairs and Handbook of Policies and Regulations Applying to All Students,* which is offered to all students during on-campus registration and is available at the Post-Registration Service Center in the Illini Union; in 177 Henry Administration Building; and at the Student Assistance Center, 107 Turner Student Services Building. The residence regulations and petitions for changing a student's status are available on request from the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 178 Henry Administration Building, 506 South Wright Street, Urbana, IL 61801.

Generally, in order to be considered a resident for the assessment of tuition, a person must have been a bona fide resident of the state of Illinois for at least six consecutive months immediately preceding the beginning of any term for which he or she registers and must continue to maintain a bona fide residence in Illinois. If an adult student has at least one parent who is a bona fide resident of Illinois, this six-month, continuous-residence rule is waived as long as the student resides in Illinois during the period of registration at the University.

Staff members of the University and allied agencies, including teaching and research assistants on appointment for at least 25 percent of full-time services for not less than three-fourths of the term as well as their spouses and dependent children, are treated as residents for tuition assessment purposes as long as they hold their appointments. Professional staff and teachers in private or public elementary and secondary schools in Illinois are also eligible for in-state tuition charges. Persons serving on active duty in one of the armed forces of the United States who are stationed and present in the state of Illinois, their spouses, and their dependent children may qualify upon petition for the in-state tuition rate. A student who is a U.S. citizen may also qualify upon petition for resident status if he or she is married to a resident of Illinois who meets all the requirements of the residence regulations. A person who is not a U.S. citizen who meets and complies with all other applicable requirements may establish residence status (by petition) unless the person holds a visa that on its face precludes an intent to reside in the United States.

Installment Plan for Payment of Charges

Students enrolled on campus may elect to pay tuition and all fees, flight instruction costs, and University residence hall charges (single-student housing only) in three approximately equal installments. The first installment is payable by the due date shown on the Post-Registration Statement (within the first ten days of classes), the second is payable in October (March for spring semester), and the third in November (April for spring semester).

Students electing the installment plan are assessed a finance charge. Deferred installments and other charges billed through the student accounts-receivable system are subject to a delinquent service charge on any amounts not paid when due.

Refunds

Students who have not attended any classes nor received any student services may cancel their registration agreement by 5 p.m. on the first day of class in a term, if they obtain the approval of the dean of the Graduate College. Students will not be charged tuition and fees if their registration is cancelled. Students must bring letters to the Graduate College Records Office from each of their instructors verifying that they have not attended classes after the first day of class.

If students withdraw from the University during the first ten days of instruction in a semester or during the first seven days in the eight-week summer session, tuition and a portion of fees will be refunded. The University will refund tuition and one-half of the service fee and the general fee, but the McKinley Health Service fee and the health insurance fee are nonrefundable. Health services and insurance coverage for students continue until the end of the term. The last day for the tuition refund and partial service-fee and general-fee refund is noted in the *Graduate College Calendar* and in the calendar printed in each semester's *Timetable.* In cases of serious illness or injury, exceptions to these refund periods may be made by the director of admissions and records. Special refunds are provided for students who withdraw for military service after the ten- or seven-day period. If it is necessary to withdraw from the University and there is a question concerning a refund, a student should first inquire in the Graduate College Student Records Office, University of Illinois at Urbana-Champaign, B-3 North Coble Hall, 801 South Wright Street, Champaign, IL 61820.

FINANCIAL AID AND EMPLOYMENT

Financial aid is available in the form of fellowships, tuition and service fee waivers, college work-study programs, and loans. Employment is available in the form of teaching and research assistantships.

Application Procedures

When students submit a single Application for Graduate Appointment to their major department, they will be considered for fellowships (except those awarded in national competitions), tuition and service fee waivers, and departmental assistantships. Prospective students should complete the Combined Application for Admission to the Graduate College and Application for Graduate Appointment to be considered for these appointments. The Graduate College administers most of the fellowship and waiver awards. Financial need is not a factor in awarding fellowships, waivers, or assistantships administered by the University. Application for Graduate Appointment forms for continuing students can be obtained from the Graduate College or from any graduate department.

Continuing or new students should file applications with their major department no later than February 15 and preferably earlier. (Some departments have deadlines earlier than February 15.) While departments may, at their discretion, accept applications for assistantships and waivers after the February 15 deadline, most departments attempt to make their financial aid decisions in February and March. Departmental committees recommend students for fellowships or waivers to the Graduate College, which makes the final selections. Each department appoints its own teaching or research assistants with the approval of the Office of the Vice-Chancellor for Academic Affairs. Fellowships can be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates. The first list of fellowship awards is usually announced in mid-March.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible to compete for University fellowships, which are awarded on the basis of academic and scholarly achievement. A student need not be a U.S. citizen to apply. Departments (with Graduate College approval) may combine University Fellowship stipends with teaching or research assistantship appointments. Students should consult their departments about available support.

Graduate College Fellowships. These fellowships are part of the Graduate College's effort to increase the enrollment of minority students in those academic areas where they have traditionally been underrepresented. Graduate College fellowships are generally awarded to students who are beginning graduate work so that they can devote their first year entirely to study.

Most Graduate College fellows are given support in the form of other fellowships and assistantships to continue their studies in subsequent years, provided their progress is satisfactory; however, continued support cannot be guaranteed in advance. Graduate College permission is required for concurrent employment of any type.

Industrial, Endowed, and Special Fellowships and Traineeships.
A number of firms, foundations, and individuals support fellowship awards for graduate students. The stipends and supplemental allowances for these fellowships vary, and most of them are restricted to students in particular areas of study. In almost all cases, these awards provide tuition and most fees. Students should consult their departments about the availability of these fellowships.

Federal Fellowships. These fellowships, such as the U.S. Public Health Service traineeships in the biomedical sciences and the Patricia Roberts Harris fellowships in fields where minorities are underrepresented, are awarded as grants to institutions, which then select the recipients. Students should consult their departments as to the availability of these awards. Applicants for most federal fellowships must be U.S. citizens or permanent resident aliens; some programs are restricted to U.S. citizens.

Fellowships Awarded in National Competition. The National Science Foundation awards approximately 550 fellowships nationwide each year to exceptional students in science and engineering, the social sciences, and the history and philosophy of science. They are restricted to students who have completed not more than one semester of graduate study and will be continued for up to three years contingent upon satisfactory progress. Applications are available in October from the Graduate College Fellowship Office, University of Illinois at Urbana-Champaign.

The Mellon Fellowships in the Humanities are awarded to top-level, beginning graduate students who plan careers of teaching and scholarship in the humanistic disciplines. A Mellon Fellowship provides a stipend for a maximum of three years as well as complete remission of tuition and fees and is tenable at any accredited graduate program in the United States or Canada. A prospective applicant must be nominated by a faculty member. The nomination deadline is November 4 of each year. For information, write Mellon Fellowships in the Humanities, P.O. Box 288 (16 John Street), Princeton, NJ 08540.

The Office of Naval Research awards three-year fellowships to outstanding students in certain fields in the sciences and engineering. U.S. citizens studying at PhD-granting institutions are eligible. Applications are available in the Graduate College Fellowship Office each January.

Subject to the availability of funds, the Jacob Javits Fellowship Program, administered by the U.S. Department of Education, awards about 100 fellowships each year in a nationwide competition. The fellowships provide all tuition and fees as well as a stipend calculated on the student's financial need. U.S. citizens and permanent residents are eligible to apply. Applications are available in the late fall.

A few other foundations and agencies also hold fellowship competitions but on a smaller scale and usually restricted to specific groups, such as the Committee on Institutional Cooperation fellowships for minority students or the American Association of University Women fellowships. Information on these and other fellowships is available early each fall in the Graduate College Fellowship Office.

Assistantships

General Information. The various departments of the University appoint graduate students as teaching or research assistants. Application should be made directly to the appropriate department using the Application for Graduate Appointment. Persons holding assistantships must be registered during the semesters of employment and, in the case of assistantships requiring the performance of classroom teaching, be proficient in oral English as determined by current University verification standards. Assistantship appointments ranging from 25 through 67 percent time for three-quarters of the semester provide waivers of tuition and part of the fees. Students who held such waivers during the spring semester, and who have no appointments the following summer, are also entitled to a waiver of tuition and part of the fees for that summer session. As an additional benefit, spouses and dependent children of staff members who have appointments of at least 25 percent time are treated as residents for purposes of tuition assessment. Students may also apply for assistantships in nonteaching units of the University, such as the Survey Research Laboratory.

Part-time appointments as student residence hall advisers also are available. These jobs provide room and board only. The student affairs coordinator for staff development in the Housing Division has applications for residence hall adviser appointments.

A student who resigns an appointment before working for at least three-fourths of the term (ninety-one days during the regular semester, forty-one days during the summer session) will be assessed tuition and fees unless the student either withdraws from the University at the same time or before the appointment becomes void or files a clearance form for graduation within one week after the resignation date. A term is defined as running from the first day of registration through the last day of final examinations.

College Work-Study Assistantships

The Graduate College operates a small program of research and administrative assistantships funded by the College Work Study program. Prospective applicants must have obtained employment at the time of application, which should take place before January 31 of each year. To apply, the applicant should fill out a screening questionnaire in the Fellowship Office, 209 Coble Hall. If eligible, he or she may use the need-based financial aid procedure described on page 41.

Tuition and Service Fee Waivers

In addition to the tuition and service fee waivers that accompany fellowships and assistantships, the Graduate College awards a number of waivers each year. These waivers provide exemption from tuition and some fees for the academic year and the summer session immediately preceding or following that year. To hold a waiver, a student must register for at least 3 units each semester during the academic year and 1½ units in the summer session. While holding a waiver, a student may accept part-time or incidental employment not to exceed twenty hours per week either with the University or with an outside employer.

Research Grants

Graduate College Dissertation Research Grants. If funds are available, the Graduate College offers dissertation research grants to students with superior academic records. For further information, inquire in the Graduate College Fellowship Office.

Other Research Grants. A great number of organizations and foundations offer grants to support research in specialized fields. Information on these grants can be obtained from the Graduate College Fellowship Office, the Research Services Office, and departmental offices. Some schools and colleges publish additional materials concerning research grants and contracts. The Research Services Office compiles information on research grants and publishes the *Graduate Student Handbook on Financial Assistance;* staff members will assist researchers in their search for funding.

Need-Based Financial Aid

The Office of Student Financial Aid awards limited scholarships, college work-study, and loans to graduate and professional students. Application for this need-based assistance is made separately from an application for fellowships, assistantships, and tuition and service fee waivers. A need analysis document, either the Family Financial Statement (FFS) or the Financial Aid Form (FAF), must be completed. To ensure priority consideration, the document should be filed between January 1 and March 15 of each year.

A student wishing to borrow a Guaranteed Student Loan must file the FFS or FAF in addition to the loan application. Students are advised to delay processing the guaranteed student loan application until they have received responses to applications for other need-based assistance and fellowships, assistantships, and tuition and service fee waivers.

Additional information about need-based assistance and application packets containing the Family Financial Statement are available from the Office of Student Financial Aid.

If certification for full-time status is required (for example, for loans, immigration, or fellowships), registration must be for at least 3 units or the equivalent.

Veterans' Assistance

Veterans who believe they may be eligible for educational benefits should contact the veterans' counselor in the Office of Student Financial Aid. Application for benefits should be made annually.

Employment

Part-time job opportunities, both on and off campus, are posted in the Office of Student Financial Aid. Students are not required to apply for need-based assistance to use employment staff services.

Emergency Loans

In addition to major educational loans, the University makes special funds available. Graduate students with financial problems should go to the Office of the Dean of Students. Staff members in that office can determine the eligibility of these students for emergency loans.

Students may also apply for guaranteed loans through lenders in their hometowns who participate in one of the various guaranteed loan programs.

GRADUATE COLLEGE REQUIREMENTS

The following are the general requirements of the Graduate College. *A Handbook for Graduate Students,* which is distributed to all graduate students enrolled at the University of Illinois at Urbana-Champaign, gives the requirements in more detail. Graduate students should use it as the official statement of Graduate College regulations during their graduate study on the Urbana-Champaign campus. Departments may have requirements that apply in addition to those of the Graduate College. A departmental standard higher than that of the Graduate College (e.g., the minimum grade-point average for degree eligibility) replaces the Graduate College standard.

Departmental and Graduate College policies and requirements change from time to time, and may not be immediately reflected in handbooks and other publications. New degree requirements, however, cannot be imposed retroactively on continuing graduate students. If degree requirements are changed, continuing students may complete their degree programs under the requirements in effect at the time of their initial enrollment in the Graduate College. They have the option, however, of electing to be governed by the new requirements if they so desire.

The Graduate College will generally grant no more than two advanced degrees to one individual, nor permit a student to earn a graduate degree similar to one obtained elsewhere. Admission to a second nonprofessional (e.g., PhD, EdD, DMA) doctoral program will be permitted by special approval of the dean of the Graduate College upon the recommendation of the department or equivalent unit.

Grading System

Final Grades. Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and Ab or E (failure). No credit will be given for a course in which the grade of E or Ab was received. The grade-point average (GPA) is computed on a five-point scale with A equal to 5.0. Plus and minus signs do not appear on a graduate student's official transcript and are not used in computing the GPA, but they may be recorded on departmental records.

Other symbols used, but not included in the computation of the GPA, are

W— Officially withdrawn from a course.

Ex— Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next term in which the

student is enrolled. Failure to complete the work within this time automatically results in a grade of E by rule. If the student does not enroll the following term, the excused grade becomes an E by rule after one calendar year.

Df— Grade temporarily deferred. Used only in research and other approved courses that extend beyond one term. The time limit for the Df grade to revert to E by rule is the same as for the Ex grade except for the thesis research course (499).

S or U— Satisfactory or unsatisfactory. Used as final grades in the thesis research course (499) and in certain other approved courses.

CR or NC— Credit or no credit. Used only if a student has registered for a course under the credit–no credit option with the approval of his or her major department.

Ab— Absent from the final examination without an acceptable excuse. This grade counts as a failure.

Credit–No Credit Option. Subject to the restrictions of the major department and with his or her adviser's approval, a student may register for graduate credit under the credit–no credit option. The student must, however, have at least 2 units of course work in the graduate program with grades of A through C for every unit of credit–no credit work.

GPA Computation. A registered student's GPA is computed at the end of every term and reported in the Semester Grade Report, which is mailed to the student about ten days after the final day of examinations. The GPA includes units of course work with grades of A through E and Ab but not those with grades of CR, NC, Ex, Df, S, and U. The GPA does not include courses taken for semester hour credit (for example, physical education courses); nor does it include course work transferred from other universities or colleges with the exception of the Chicago campus of the University of Illinois. If a grade below C is received, a student should check with his or her adviser or department to see if the course must be repeated; a student may also choose to repeat a course. In either case, repeated courses are ignored in the computation of a graduate student's GPA and the accumulated credits toward a degree.

Minimum GPA. A student is required by the Graduate College to maintain a minimum GPA of 3.75 in order to continue in an advanced degree program. Many departments, however, demand a minimum of 4.0 or higher, and when they do, their minimums are enforced by the Graduate College.

A student who completes 3 or more units of graded course work with a GPA of less than the minimum will receive a warning letter from the Graduate College. If after the completion of 3 additional units of graded course work a student's GPA has not been raised to or above the required minimum, or if the GPA falls below it at any time thereafter, the student will be placed on limited status. If the student's average does not meet the minimum requirement at the end of the first term on limited status, further registration will be prohibited.

Advisers and departments take factors other than satisfactory grades into consideration in determining qualifications for advanced degrees. An adequate GPA does not in itself ensure continuance in an advanced degree program. Records maintained by departments often record deferred and plus and minus grades as well as written evaluations by instructors. These factors, along with other skills and aptitudes, are taken into consideration in departmental decisions about permitting students to continue in master's and doctoral programs.

Credit

Graduate Credit. Graduate credit at the University of Illinois at Urbana-Champaign is measured in terms of units, with 1 unit equal to approximately 4 semester hours. Generally, courses in the 300 series carry graduate credit and are open to both graduate and undergraduate students. Courses in the 400 series, with the exception of some courses such as foreign language, carry graduate credit. Enrollment in these courses is restricted to graduate students or seniors who have petitioned and who meet the requirements to take graduate-level courses.

Proficiency Examinations. Credit earned by passing proficiency examinations cannot be applied to the requirements for advanced degrees, but such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in areas considered important to a student's area of study. A proficiency examination will be recorded only if the student is registered at the time of the examination. These examinations are usually given without cost to the student, but a fee may be charged to defray the cost of examinations prepared by agencies outside the University. Students should consult their advisers before applying for proficiency examinations.

Credit for Work Completed Elsewhere. A student who has completed graduate work elsewhere within the last five years, but has not applied the credit toward any advanced degree, may request that the credit earned for that work be applied to a degree at the University of Illinois at Urbana-Champaign. Students may request that such credit be accepted by submitting petition forms accompanied by official transcripts after successfully completing at least 2 units of graduate work on the Urbana-Champaign campus. Credit for a master's degree completed at the University of Illinois or at another institution cannot be used as partial fulfillment of the requirements for a second master's degree. If a student has earned a master's degree at another university and then completed additional course work at an accredited institution before enrolling at the University of Illinois, that student may petition to transfer credit for that additional work. A student having a master's degree is considered to have completed the first stage of a doctoral program unless the department stipulates otherwise. It should be stressed, however, that all doctoral candidates, regardless of transfer credits or master's degrees completed elsewhere, must complete 16 units in residence on the Urbana-Champaign campus or in courses meeting in other locations that have been approved by the Graduate College for graduate credit.

Research Credit and 499. The time devoted to research is recorded by registration in 499 (thesis credit) or in 400-level courses with such titles as "Independent Study" or "Special Topics." Registration in 499 indicates that the student's research is expected to result in a thesis in partial fulfillment of the requirements for a master's or doctoral degree. Therefore, all students registering in 499 should do so only with full departmental approval. Registration in 499 is required if a thesis is being completed as a degree requirement.

Extramural Courses. Graduate courses are offered by members of the University faculty at various centers throughout the state. Pamphlets listing these courses can be obtained from the Office of Continuing Education and Public Service. An extramural course is considered as work in residence if it is approved for graduate credit by the department offering the course and the Graduate College. Credit earned in extramural courses can be applied toward an advanced degree only if the courses are approved in advance by the adviser and constitute part of a well-integrated program.

The units of credit required for the master's degree must be earned in courses meeting on the Urbana-Champaign campus or in courses approved by the Graduate College for offering at off-campus locations. Credit for extramural courses can be applied to the second stage of a doctoral program only within the limits of campus residence expected by the department offering the degree.

Correspondence Courses. Credit for correspondence courses cannot be applied toward an advanced degree but can be used to fulfill prerequisites or remove deficiencies. A list of correspondence courses is available from the Office of Continuing Education and Public Service.

Requirements for the Master's Degree

The Graduate College requires a minimum of 8 units of credit for the master's degree. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. Credit applied toward the degree must be earned in courses meeting on the Urbana-Champaign campus, on the Chicago campus, or in other locations if approved by the Graduate College for graduate credit. Master's degrees are conferred in May, August, October, and January. Master's candidates must complete all degree requirements, under normal circumstances, within five years after their first registration in the Graduate College.

Some departments require a final examination for the master's degree. Individual departments also determine master's degree thesis requirements. Some departments require or recommend a thesis, but others ask for a "substantial research paper" or require only the minimum 8 units of course work. Thesis credit is earned in courses numbered 499 in each department. No more than 3 units, and in some departments only 2 units, of 499 can be applied to the master's degree.

Requirements for the Doctoral Degree

Credit and Residence. Doctoral programs are divided into three stages, as described below, and must include a minimum of 24 units of credit. At least 16 units, including thesis credit, must be earned in courses meeting on the Urbana-Champaign campus, at the Chicago campus, or in other locations that have been approved by the Graduate College for graduate credit. After the residence requirement has been fulfilled, a student who plans to leave campus may petition the Graduate College for permission to register in absentia for thesis credit.

Stage I— The master's degree or its equivalent (8 units, or 32 semester hours, of acceptable graduate work at this or another accredited university).

Stage II— One or more additional years devoted to course work and research in preparation for the preliminary examination, and fulfillment of the department's special requirements, if these have not been satisfied earlier. Each department has a procedure for evaluating a student's progress toward the doctorate. This evaluation, whether by examination or other formal review, results in a decision as to whether or not a student is making satisfactory progress. This decision will be communicated in writing to the student and to the Graduate College. Such evaluation will take place no later than the end of the second year after a student enters the Graduate College. In some departments, this evaluation may take the form of a qualifying examination that a student must pass before entering Stage II of a doctoral program. Passing the preliminary examination marks the end of Stage II.

Stage III— Research and other activities culminating in an approved dissertation and final oral examination. Continuous registration, excluding summer sessions, should be maintained until a student has completed the credit requirement for the doctoral degree. If a student at this stage cannot maintain continuous registration, he or she must apply for readmission in order to continue doctoral study. Registration in 499 (thesis credit) is also required for the term in which a student takes the final examination, regardless of when the thesis will be deposited with the Graduate College or when the degree will be conferred.

Time Limit. Doctoral candidates must complete all degree requirements within seven years after their initial registration in the Graduate College. A student entering directly into Stage II, with a master's degree from another university or with a significant lapse of time since earning a master's degree on this campus, has six years in which to complete degree requirements.

Foreign Language Requirement. Each department establishes its own foreign language requirement; some allow for substitution of research skills in computer programming language or statistical analysis.

Preliminary and Final Examinations

Preliminary examinations taken at the end of Stage II of doctoral programs may be oral, written, or both, depending on the department's policy. Final examinations are oral and public.

The dean of the Graduate College appoints doctoral committees, at departmental request, to administer preliminary and final examinations. These committees must be composed of three or more members of the graduate faculty.

Decisions of the committees for both preliminary and final examinations must be unanimous. Each department outlines its policies regarding preliminary and final examinations as part of the description of its advanced degree programs and requirements that is distributed to graduate students in the department.

Theses

All candidates for the PhD and candidates for most other doctoral degrees are required to write a thesis. Individual departments may have special requirements in this respect. In addition, all completed theses must be acceptable for deposit in the Graduate College; a thesis that fails to meet Graduate College standards will be rejected. The thesis must be the work of a single author.

Before the degree is conferred, a student may find it desirable or expedient to publish some of the findings that will later be incorporated in the thesis. If this is done, an appropriate acknowledgment of the earlier publication should be included in the thesis. The Graduate College encourages such publication, but the thesis may not be published in its entirety before all degree requirements have been met.

If thesis research involves the use of human subjects, warm-blooded animals, hazardous materials or procedures, or PLATO™ services, the student must comply with the University's policies and procedures governing such work.

Because all theses are made available to the public, a thesis containing classified material, i.e., material deemed nonpublishable under Federal Security Regulations, cannot be accepted.

Advanced Certificate

Some departments, such as those in the College of Education, offer advanced certificates for those students who are interested in additional professional training beyond the master's degree but who are not planning to obtain the doctorate. These programs usually require the completion of 8 units of course work beyond the master's degree. Information concerning specific advanced certificate programs is available from departmental offices.

Programs of Study

The graduate programs offered by the Graduate College, through the various divisions, schools, institutes, centers, and departments of the University of Illinois at Urbana-Champaign, are described on the following pages, as well as the areas of specialization within these programs. Included also are the offerings of several interdisciplinary areas of concentration, such as population studies, environmental studies, American civilization, and African, Asian, Russian, and Latin American area studies.

The minimum requirements for admission and other requirements for graduate degrees are given for each program. The prospective student is reminded that he or she is seeking admission to the Graduate College of the University of Illinois at Urbana-Champaign and cannot be admitted to the college or to a particular academic department offering programs leading to advanced degrees without satisfying the admission requirements of both. Likewise, both departmental and Graduate College requirements must be met before an advanced degree is awarded by the University of Illinois at Urbana-Champaign. If departmental requirements are higher than the minimum Graduate College requirements, the higher standard applies.

The University of Illinois at Urbana-Champaign *Courses* catalog, published biennially, lists all the undergraduate and graduate courses offered at the Urbana-Champaign campus. A listing of courses offered each term is published in the *Timetable,* issued in April for the fall semester, in March for the summer session, and in October for the spring semester. Copies of the *Courses* catalog and *Graduate Programs* catalog are for sale through the Illini Union Bookstore, 715 South Wright Street, Champaign, IL 61820. Copies can also be purchased by mail from the bookstore. The *Timetable* is available free of charge at the information desk of the Illini Union. The graduate application for admission packet is available free of charge from the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820.

ACCOUNTANCY

Head and Director of Graduate Studies: L.A. Tomassini

Correspondence and Information: Head, Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: P.J. Beck, N.M. Bedford, G.D. Brighton, I. Bull, T.J. Frecka, H.P. Holzer, O.E. Johnson, Y. Kwon, F.L. Neumann, H.M. Schoenfeld, I. Solomon, L.A. Tomassini, E. Willis, V.K. Zimmerman

Associate Professors: M.H. Berry, C.E. Brown, J.S. Chandler, R.W. Jamison, D. Kleinmuntz, H. Molloy, P.A. Silhan, R.E. Ziegler

Assistant Professors: J. Davis, N. Desmond, W. Dilla, W. Jung, T. Liang, T. O'Leary, T. Omer, G. Rao, S. Reiter, M. Shelley, D. Stone, W. Teets, D. Ziebart

Graduate Degree Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science (MAS) and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the MAS degree requirements can be completed in one year. For nonbusiness graduates, the MAS degree can be earned in two years. The PhD degree takes approximately three to four years of full-time study and research.

Admission. All applicants, native or international, are required to take the Graduate Management Admission Test. This test should be taken early enough to ensure that the results will be available to the department prior to action on admission. The admission requirements of the Graduate College also apply. In addition, all international applicants must take the Test of English as a Foreign Language and the Test of Spoken English.

Master of Accounting Science. The Master of Accounting Science degree offers a two-year program for a student with little or no background in accounting or as little as one year's study for a student who wishes to expand on an undergraduate degree in accountancy or another business field. All candidates are required to complete at least 8 units of course work. At least 5 units must be at the 400 level; 4 units must be in accounting; and of these 4 units, 3 are specified and 1 is elective. The remaining 4 units are general electives available for meeting the individual student's plans. For example, the student may use some or all of them to develop an area of specialization, such as auditing, taxation, information systems, financial accounting, managerial accounting, not-for-profit accounting, or international accounting. A student's program is individually developed in consultation with a faculty adviser. No thesis is required, although the student may elect to write one.

To be eligible to complete the MAS program in 8 units, a student should have completed an equivalent of the undergraduate curriculum in accountancy at the University of Illinois at Urbana-Champaign, including the following: at least 21 hours of undergraduate work in accounting; a course in general economic theory, in intermediate microeconomics, in computer programming and applications, and in each of the functional fields of business; two courses in statistics; and courses including finite mathematics, linear algebra, and calculus.

A student with little or no business and accounting background is required to complete as many as 8 additional units of work. In the first year of this two-year program, a student takes four specified graduate courses in accountancy. Depending upon his or her background, the student also enrolls in courses in statistics, economics, mathematics, computer programming, and the functional areas of business. A student who already meets any of the requirements of the two-year program receives some credit toward the total 16-unit requirement. In the second year, the requirements are those for all MAS students, as described above.

Master of Science in Accountancy with Specialization in Taxation. The department also offers a separate master's degree in taxation. Students who have been admitted into the MAS program may transfer into the MS (Taxation) program. The program combines required courses in taxation with electives, both within and outside the department. The total program consists of 8 units of course work, of which at least 6 units must be in taxation.

Doctor of Philosophy. Applications for admission to the doctoral program, supported by three letters of recommendation, must be approved by the department admissions committee, which may require an oral or written examination. For a student with a bachelor's degree and adequate background in appropriate areas, the requirements for the doctor of philosophy degree include the following: credit in micro- and macroeconomics; two courses in behavioral science or financial economics; two courses in statistics; five minor area and research technique courses (four of which must be nonaccounting courses); four accounting courses; and the thesis. The student's doctoral program is determined in consultation with a faculty advisory committee. The student's tentative plans for the doctoral thesis serve as a guide in planning the program.

In addition, the candidate must pass written and oral preliminary examinations and an oral final examination on the doctoral thesis. In the preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory in both its external and internal dimensions and of research methods; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in the required areas of economic theory, quantitative methods, and behavioral science or financial economics. Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the accountancy graduate program.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to help accounting faculty members and students from other countries come to the University of Illinois at Urbana-Champaign for study and research in accountancy.

The Office of Accounting Research (OAR) was established in 1983 as the research arm of the Department of Accountancy. The mission of OAR is divided into three distinct parts: 1. Identify seminal programs that would benefit from attention. The ultimate goal is to generate ideas and concepts that impinge on the development of the accounting discipline. 2. Support major research by providing guidance and resources. 3. Disseminate research findings to both the academic and professional communities (i.e., practitioners, corporate executives, educators, and regulators).

ADVERTISING

Head of the Department: K.B. Rotzoll
Correspondence and Information: Director of Graduate Studies in Advertising, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801.

GRADUATE FACULTY

Professor: K.B. Rotzoll
Associate Professors: J.E. Haefner, T.C. O'Guinn, T.K. Srull
Assistant Professors: J.A. McCarty, S.E. Middlestadt, S. Shavitt

Graduate Degree Program. The Department of Advertising offers graduate work leading to the master of science degree. For the program leading to the Doctor of Philosophy in Communications, see page 78.

Admission. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an accredited institution of recognized standing. Each applicant is required to submit results from either the Graduate Record Examination or the Graduate Management Admission Test and is required to attach to the application a short essay indicating why he or she wants to take graduate work in advertising. The Graduate College admission requirements also apply.

Master of Science. Candidates for the MS degree must complete at least 9 units. A student with an undergraduate major in advertising can usually earn the MS degree in one academic year and one summer session if he or she takes a full course of study. An applicant without an undergraduate major in advertising may be required to take as many as nine background courses in addition to the 9 units.

At the time of admission, each student will be advised of the probable number of units required for graduation. At the time of registration advising, each student will be informed of the exact number of units needed to fulfill the MS requirements.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Head of the Department: W.C. Solomon

Correspondence and Information: Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.E. Bond, J.D. Buckmaster, H.H. Hilton, C.O. Hopkins, A.I. Ormsbee, J.E. Prussing, L.H. Sentman, S.S. Wang, K.A. Winkler, S.M. Yen, A.R. Zak

Associate Professors: H.O. Barthel, R.A. Beddini, L.A. Bergman, M.B. Bragg, R.L. Burton, B.A. Conway, T.A.W. Dwyer, K.D. Lee, K.R. Sivier

Assistant Professors: E. Loth, N.S. Namachchivaya

Graduate Degree Program. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of master of science and doctor of philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Typical areas of concentration are aerodynamics, computational fluid dynamics, structural dynamics, aeroelasticity, stochastic dynamics, combustion and propulsion, chemical lasers, optimal orbit analysis, guidance and control, space mechanics, and solar and wind energy.

Admission. The prerequisite for graduate study usually is the equivalent of the undergraduate courses required at the University of Illinois at Urbana-Champaign for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Admission requirements of the Graduate College apply.

Master of Science. Candidates for the degree of master of science are required to complete a minimum of 8 units of credit: 7 units of course work and 1 unit of thesis credit. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in aeronautical and astronautical engineering. For those students terminating their studies with the MS degree, a nonthesis option is available by departmental petition. A student not writing a thesis is required to complete a minimum of 9 units of credit. At least 4 units must be in 400-level courses, and 3 of those 4 units must be in aeronautical and astronautical engineering.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of doctor of philosophy. Each student plans a program in consultation with a departmental adviser. Courses offered by departments other than the Department of Aeronautical and Astronautical Engineering may be included in the major area of study when these courses are of particular value to the work that students desire to emphasize. The major and minor programs must meet with the approval of the head of the department. Minimum requirements for the degree consist of 8 units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from 8 units of thesis research. A reading knowledge of one foreign language is optional. Students who do not elect the foreign language option must complete a minimum of 10 units of course work for the PhD degree beyond the MS degree

requirements. Of the total PhD course work requirements, at least 6 units must be at the 400 level, and 4 of these 6 units must be in aeronautical and astronautical engineering.

AFRICAN STUDIES

Director of Graduate Studies: D. Crummey
Correspondence and Information: Director of the Center for African Studies, University of Illinois at Urbana-Champaign, 1208 West California Street, Room 101, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Accad, D. Crummey, J.F. Due, J.M. Due, R. Hay, B. Kachru, R. Kanet, M. Kenstowicz, C. Kisseberth, Y. Scheven, D. Shimkin, A. Sofranko, C. Stewart, G. Yu
Associate Professors: E. Bokamba, A. Glaze, I. Kakoma, D. Prochaska, M. Saul
Assistant Professors: S. Ambrose, T. Bassett, M. Bowen, F. Cassimjee, A. Deck, A. Gottlieb, V. Hoffman-Ladd, W. Martin

Graduate Degree Programs. The Center for African Studies administers a two-year program of language and area courses leading to an interdisciplinary master of arts degree. The program provides both language and area training for three constituencies of students: those seeking to match area expertise with professional training; those proceeding to disciplinary-based doctoral work; and those for whom the degree would stand on its own. The center also administers graduate minors in African studies with various departments.

Master of Arts. A candidate must complete 8½ units of graduate credit in area studies courses, drawn from at least three different units, and study, or demonstrate proficiency in, a language indigenous to Africa to the advanced (third-year) level. One of the area courses must be African Studies 450, the center-originated interdisciplinary seminar.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects African studies as a minor must secure approval from the center and must earn at least 4 units of graduate credit in approved courses in at least two departments. Courses are available in the following fields: agricultural economics, anthropology, art history, comparative literature, economics, education, French, geography, history, linguistics, political science, and sociology.

Financial Aid. Each year the center is generally able to assist a limited number of graduate students in area studies financially through awards of Foreign Language and Area Studies Fellowships.

AGRICULTURAL ECONOMICS

Head of the Department: David L. Chicoine
Correspondence and Information: Head, Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 305 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: P.J. Barry, J.B. Braden, R.J. Burdge, D.L. Chicoine, D.E. Erickson, L.P. Fettig, P. Garcia, H.D. Guither, L.D. Hill, R.M. Leuthold, D.A. Lins, J.W. Robinson, S.B. Salamon, S.C. Schmidt, J.T. Scott, W.D. Seitz, A.J. Sofranko, S.T. Sonka, R.G.F. Spitze, J.C. van Es
Associate Professors: M.R. Grossman, R.J. Hauser, S. H. Johnson
Assistant Professors: D.S. Bullock, J.B. Crihfield, J.S. Eales, R.L. Farnsworth, R.H. Hornbaker, C.H. Nelson, G.C. Nelson, H. Onal, B.J. Sherrick, K.G. Stamoulis, S.R. Thompson, L.J. Unnevehr

Graduate Degree Programs. The Department of Agricultural Economics offers courses leading to the master of science and doctor of philosophy degrees. Areas of concentration and specialization are offered in agricultural finance, agricultural and food policy, farm management and production economics, international agricultural economics, marketing and agricultural prices, natural resource economics, quantitative and research methods, and rural community development. Rural community development has an emphasis on either agricultural economics or rural sociology.

Master of Science.
Admission. Graduate College admission requirements apply. An applicant is favorably considered for admission if he or she is adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record. Students having less than 12 semester hours of agricultural economics or economics may be required to take additional courses to adequately prepare themselves for graduate studies. Students who desire to specialize in rural community development with the rural sociology emphasis should have had a minimum of 6 semester hours of rural sociology or sociology.

The minimal 8-unit program must include 2 units of economics, at least 1 of which must be in economic theory; 4 units of agricultural economics, including thesis credit; 1 unit in quantitative methods and research methodology, which could also fulfill part of the economics or agricultural economics requirement; and 2 units of open electives. At least 4 units must be in 400-level courses, 2 of which must be in agricultural economics. No more than 2 units of thesis credit can be included in the 8-unit program. The required thesis may be waived under certain circumstances. Each student is examined orally on the thesis and/or a general knowledge of his or her field to determine qualification for the master's degree.

Doctor of Philosophy.
Admission. Graduate College admission requirements apply. An applicant with a master's degree in agricultural economics or a closely related discipline, with an outstanding scholastic record, is favorably considered for admission.

The doctoral candidate must complete 8 units of nonthesis courses beyond the master's degree. The total graduate program must include a minimum of 3 units in economics other than quantitative and research methods courses, including 1 unit each of advanced 400-level micro- and macroeconomic theory. The program must also include 1 unit each of approved courses in econometrics and in mathematical programming. The student must pass one oral and three written preliminary examinations, submit an acceptable thesis, and pass a final oral examination. A minimum of 16 units beyond the master's degree, including thesis credits, is required.

Financial Aid. University fellowships and tuition and fee waivers are awarded by the Graduate College. Several fellowships are also awarded on the basis of competition among graduate students studying in departments in the College of Agriculture. In addition, the Department of Agricultural Economics awards several fellowships and maintains a number of part-time positions for graduate students, most of them in research. These assistantships are offered on a competitive basis. For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Head of the Unit: Earl B. Russell
Correspondence and Information: Agricultural Education, University of Illinois at Urbana-Champaign, College of Agriculture, 124 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professor: B.E. Swanson
Associate Professor: P. Buriak, E.W. Osborne, E.B. Russell

Assistant Professor: D.A. Law
Emeritus Professors: P.E. Hemp, L.J. Phipps

Graduate Degree Program. The master of science program has been planned as a professional degree for students who have completed the requirements of a four-year curriculum in agricultural education or allied fields of study. Areas of concentration include youth development, adult education, curriculum development, program planning, teaching methodology, and instructional technology.

Admission. The program is open only to students who have received bachelor's degrees. The Graduate College admission requirements apply.

Master of Science. Candidates must earn 8 units: 4 units in agriculture, 2 units in education, and 2 units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields. At least 3 of the 8 units must be in 400-level courses.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than 3 units from any one department. A master's thesis is optional.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for education. Currently, agricultural education doctoral students are admitted into the Department of Vocational and Technical Education in the College of Education while working under the guidance of agricultural education faculty members in the College of Agriculture.

Financial Aid. Assistantships and waivers of tuition and most fees are provided on a competitive basis through funds provided by the College of Agriculture and the Graduate College. Part-time positions on research projects are often available. Further information and a copy of the graduate program brochure may be obtained by writing to the address above.

Major Areas of Faculty Research Interest. Research strengths among faculty members in agricultural education include curriculum reform, program planning, change orientation of educators, problem-solving instruction, psychomotor skill acquisition, extension education, youth development, and international agricultural education and knowledge systems.

Resources. Graduate students in agricultural education have at their disposal the considerable resources of the College of Agriculture and the campus. These include microcomputer and mainframe computer facilities, agricultural education archives for historical research, instructional resources, the Vocational Agriculture Service, agricultural communications, and the Office of International Agriculture.

AGRICULTURAL ENGINEERING

Head of the Department: Roscoe L. Pershing
Correspondence and Information: Head, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 338 Agricultural Engineering Sciences Building, 1304 West Pennsylvania Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L.E. Bode, D.L. Day, C.E. Goering, J.W. Hummel, D.R. Hunt, B.A. Jones, Jr., J.K. Mitchell, M.R. Paulsen, R.L. Pershing, E.D. Rodda, J.C. Siemens
Associate Professors: P. Buriak, L.C. Christianson, R.C. Coddington, S.R. Eckhoff
Assistant Professors: R.A. Aherin, N.L. Buck, L.K. Ewing, M.C. Hirschi, K.D. Konyha, J.B. Litchfield, J.F. Reid, G.L. Riskowski

Graduate Degree Programs. The Department of Agricultural Engineering offers the master of science and doctor of philosophy degrees.

Master of Science. Admission requirements include completion of an undergraduate program equivalent to the agricultural engineering curriculum at the University of Illinois at Urbana-Champaign with at least a 4.0 grade-point average (A = 5.0) for the terms containing the last 60 semester hours of course work. An applicant whose native language is not English must present a TOEFL score of 570 or more (also see Graduate College minimum). A student may concentrate study in one of the areas of research specialization listed below. Supporting course work includes mathematics; computer science; statistics; engineering mechanics; civil, electrical, and mechanical engineering; agronomy; food science; and other appropriate fields. The completion of 8¼ units and the preparation and defense of a thesis involving an analytical or experimental investigation (which satisfies 2 units of credit) are required of each MS candidate unless a waiver of thesis is granted. At least 3 of the units for the MS degree must be in 400-level courses, and 2 of these units must be in agricultural engineering. A candidate permitted to pursue a nonthesis degree must complete a minimum of 9 units.

Doctor of Philosophy. Admission is limited to individuals who have demonstrated exceptional ability through outstanding performance in obtaining the master of science degree and/or through a high degree of technical and professional accomplishment. Candidates must also satisfy entrance requirements for the MS degree program.

Opportunities for study are found in all of the areas of specialization listed below. Candidates will be required to include course work and staff consultation from the various disciplines within the University to build strong technical programs and to fulfill the standard requirements of the Graduate College. There are no foreign language requirements; however, a high degree of competence may be required in areas associated with thesis research, such as statistics, simulation, and computer programming.

Research Interests. A student may specialize in power and machinery (tillage and soil dynamics, crop production systems, pesticide application technology, finite and boundary element analysis, dynamic system simulation, and engines and alternative fuels); soil and water mechanics (agricultural hydrology, drainage, irrigation, mechanics of erosion, and water quality); structures and environment (structural analysis and design; building materials evaluation; bioprocessing of agricultural wastes and byproducts; and environmental control for plant, animal, and human biological systems); food and process engineering (engineering properties of foods, physical properties of biological products, milling, crop conditioning, grain drying, grain quality evaluation, transport phenomenon in biological materials, fermentation, nonfood uses of cereal grains, and alternative energy systems); or electronic and electrical systems (biosensors and controls, nuclear magnetic resonance imaging, machine vision, near-infrared reflectance applications, energy systems, and microprocessor control applications).

Financial Aid. Fellowships, supported both by University and by College of Agriculture funds, are available on a competitive basis. A limited number of assistantships, providing both teaching and research experience, are usually available on a half-time basis.

AGRONOMY

Acting Head of the Department: C.M. Brown

Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-203 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.E. Alexander, W.L. Banwart, R.L. Bernard, C.W. Boast, C.M. Brown, S.G. Carmer, J.W. Dudley, D.W. Graffis, R.A. Griffin, H.H. Hadley, R.H. Hageman, J.E. Harper, J.J. Hassett, J.D. Hesketh, T.D. Hinesly, R.G. Hoeft, D.A. Holt, T. Hymowitz, J.A. Jackobs,

R.L. Jones, E.L. Knake, R.J. Lambert, J.R. Laughnan, M.D. McGlamery, D.A. Miller, J.J. Nicholaides III, C.D. Nickell, W.L. Ogren, T.R. Peck, D.B. Peters, M.J. Plewa, A.R. Portis, R.W. Rinne, R.D. Seif, F.W. Slife, D.M. Steffensen, F.J. Stevenson, E.W. Stoller, W.M. Walker, L.M. Wax, L.F. Welch, J.M. Widholm

Associate Professors: D.P. Briskin, M.A. Cole, R.G. Darmody, A.G. Hepburn, M.G. Huck, R.L. Mulvaney, E.D. Nafziger, R.L. Nelson, K.R. Olson, E.B. Patterson, G.E. Pepper, J.W. Stucki, L.O. Vodkin

Assistant Professors: F.E. Below, T.J. Bicki, S.E. Hollinger, F.L. Kolb, A.L. Kriz, R.A. Liebl, A.L. Rayburn, T.R. Rocheford, W.R. Roy, F.W. Simmons, R.H. Teyker, R.M. Vanden Heuvel

Graduate Degree Programs. The Department of Agronomy offers course work leading to the master of science and doctor of philosophy degrees. Great flexibility exists for planning programs in various areas, and no rigid curricula are prescribed. The following areas of specialization indicate the breadth of opportunities, although they are not mutually exclusive: biometry and data processing, crop ecology, crop evolution, crop production, environmental agronomy, environmental physics, genetic engineering, international agronomy, pedology, plant breeding and genetics, plant cytogenetics, plant molecular genetics, plant physiology and biochemistry, soil microbiology and biochemistry, solid chemistry and mineralogy, soil fertility, soil management and conservation, soil physical and colloidal chemistry, soil physics, water relations and management, and weed science.

Admission. Applicants whose highest degree is the bachelor's degree will be considered for admission to the MS program. Admission to the PhD program will be considered for applicants with the MS, those nearing completion of the MS, and in rare cases, those with the BS. Because of the diversity of programs in the Department of Agronomy, there is considerable variation in the preparation that is needed. Undergraduate training equivalent to that required at the University of Illinois at Urbana-Champaign for majors in agricultural science (plant or soil science), agronomy, crops, or soils is appropriate. For some programs, greater emphasis is given to previous training in plant sciences, chemistry, geology, or mathematics. In all cases, previous experience or other significant evidence of serious interest in crops and/or soils is expected. A grade-point average of at least 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. A candidate must complete 8 units of graduate study as approved by his or her graduate advisory committee with a grade-point average of at least 4.0, present an acceptable thesis, and pass an oral examination. At least 3 units must be at the 400 level, including at least 2 units in agronomy and at least 1 unit of course work other than Agronomy 499. An acceptable thesis is required, although in unusual situations, the thesis may be waived by petition and additional course work substituted. The master's examination is oral, although written examinations may be required at the option of the examining committee.

Doctor of Philosophy. A candidate must complete a minimum of 24 units of graduate study (16 units of in-residence credit beyond the MS, 8 units of which must be course work approved by his or her advisory committee and with a grade-point average of at least 4.0). For a student admitted without an MS, an oral examination must be passed after completion of 5 (or more) units of graded course work. Each student is required to pass an oral preliminary examination, usually after completion of the PhD course work requirements. An acceptable thesis is required. An oral final examination, consisting of a defense of the thesis and examination on such other matters as members of the examining committee may select, is required. The qualifying, preliminary, and final examinations may include written sections at the option of members of the examining committee. At least 4 units of 300- or 400-level courses outside the Department of Agronomy are required. Residence requirements are the same as those of the Graduate College.

If the graduate advisory committee requires a student to demonstrate reading competence in French, German, or other approved foreign languages, the course work requirement may be reduced by 1½ units for each foreign language (maximum of 3 units substituted). A student whose native language is not English may fulfill the requirement for one language with his or her native tongue, if approved by the advisory committee.

Research Interests. Excellent laboratory, greenhouse, and field research facilities are available. A network of experimental locations throughout the state and cooperative arrangements with other states make studies possible under a wide range of environmental and climatic conditions. The department's involvement in international programs may provide opportunities to conduct thesis research abroad. Brochures that provide more details about the graduate program and faculty research interests are available upon request.

Financial Aid. Fellowships and assistantships are available to outstanding students on a competitive basis.

AMERICAN CIVILIZATION

Graduate Degree Program. An interdisciplinary concentration in American civilization is available, leading to the master of arts or doctor of philosophy degree. Students interested in this program enroll in the Department of History. Further information may be obtained from the Department of History.

ANIMAL SCIENCES

Acting Head of the Department: D.H. Baker
Correspondence and Information: Department of Animal Sciences, University of Illinois at Urbana-Champaign, 328 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.M. Bahr, D.H. Baker, P.J. Bechtel, M.P. Bryant, T.R. Carr, J.H. Clark, J.E. Corbin, R.G. Cragle, S.E. Curtis, P.J. Dziuk, R.A. Easter, G.C. Fahey, Jr., U.S. Garrigus, D. Gianola, W.R. Gomes, R.W. Gorden, M. Grossman, P.C. Harrison, K.W. Kelley, B.L. Larson, J.R. Lodge, R.I. Mackie, S.P. Mistry, J.L. Robinson, S.L. Spahr
Associate Professors: G.L. Czarnecki-Maulden, H.W. Gonyou, C.N. Graves, E. Groeneveld, W.L. Hurley, E.H. Jaster, D.J. Kesler, L.M. Lawrence, H.A. Lewin, F.K. McKeith, N.R. Merchen, M.R. Murphy, J.E. Novakofski, D.F. Parrett, C.M. Parsons, L.B. Schook, R.D. Shanks, D.L. Thomas, L.H. Thompson
Assistant Professors: J.K. Drackley, D.B. Faulkner, R.L. Fernando, K.H. Kline, D.G. McLaren, J. Odle, D.P. Philipp, M.B. Wheeler, B.A. White

Graduate Degree Programs. The Department of Animal Sciences offers graduate work leading to the master of science and doctor of philosophy degrees. Fields of specialization include animal breeding and genetics, animal behavior, biochemistry, environmental physiology, immunobiology, meat science and muscle biology, microbiology, nutrition, systems of animal management and production, physiology of lactation, and physiology of reproduction. Beef and dairy cattle, horses, poultry, sheep, swine, and a variety of companion and laboratory animals are available for study.

Admission. In addition to meeting the Graduate College admission requirements, the student must demonstrate proficiency in the biological and physical sciences at the undergraduate level and interest in animal sciences.

Master of Science. Each student will be required to complete a minimum of 8 units of graduate credit, including 5½ units of lecture and laboratory classes, ½ unit of seminar, and 2 units of thesis research. At least 3 units of credit must be in 400-level courses, including at least 2 units in animal sciences and at least ½ unit of lecture and laboratory classes. Students will be expected to register for graduate seminar (0 to ½ unit of credit) during each semester of study. A comprehensive oral examination concerning the thesis and other areas of animal agriculture will be required.

Doctor of Philosophy. The doctoral candidate must complete a minimum of 16 units of credit beyond the requirements for the MS degree, including 7 units of advanced lecture and

laboratory courses, 1 unit of seminar, and 8 units of thesis research. The student must pass preliminary examinations administered by committees appointed by the dean of the Graduate College. The final examination is limited to a presentation and defense of the thesis research.

ANTHROPOLOGY

Head of the Department: Thomas J. Riley
Director of Graduate Studies: F.K. Lehman
Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.J. Bareis, E.M. Bruner, C.E. Cunningham, J.W.D. Dougherty, E. Giles, H.A. Gould, D.C. Grove, D.W. Lathrap, F.K. Lehman, B. Nettl, D.W. Plath, N.E. Whitten, Jr., R.T. Zuidema
Associate Professors: P.A. Garber, C.M. Keller, L.L. Klepinger, R.B. Lewis, E. Mayer, T.J. Riley, M. Saul, O. Soffer-Bobyshev
Assistant Professors: S.H. Ambrose, A.S. Anagnost, A. Gottlieb, G.G. Pope
Emeritus Professors: J.C. McGregor, D.B. Shimkin

Graduate Degree Programs. The Department of Anthropology offers graduate work leading to the master of arts and the doctor of philosophy degrees.

Admission. A student without the equivalent of this department's undergraduate concentration may be admitted to either degree program but will be required to make up deficiencies in his or her background in anthropology. The Graduate College admission requirements apply.

Master of Arts. The master's degree can be a first stage toward the doctorate or may be used by a student wishing to apply a knowledge of anthropology to some related field. A candidate for the master's degree must complete at least 8 units of graduate credit and present a thesis or paper in lieu of a thesis acceptable to two members of the graduate faculty within the Department of Anthropology. At least 3 units must be at the 400 level, and 2 of these units must be in anthropology.

Doctor of Philosophy. Requirements for the PhD include 16 units of graduate course work beyond the MA, a preliminary examination administered by the student's advisory committee, and a final examination. The preliminary examination consists of a predissertation research paper, a proposal for doctoral research, and a written examination designed by the student's doctoral committee followed by a two-hour oral examination conducted by the same committee. The final examination is a defense of the doctoral thesis, which is also conducted by the student's doctoral committee. High proficiency in one or reading ability in two foreign languages is required; however, statistics, computer science, or similar expertise may be used to satisfy the requirements in place of one foreign language. Fieldwork is strongly recommended though not required.

Research Interests and Facilities. Courses and individualized study provide broad coverage of a sociocultural, linguistic, archaeological, and physical anthropology. The department provides special emphases in the analyses of state ideologies and cultural transformations; complex societies in transition; kinship and gender relationships; symbolism, cosmology, art, and religion; politics, economics, and ethnicity; language and culture; text and narrative; formal analysis and mathematical modeling; medical anthropology; agricultural origins, evolution, and development; hunter-gatherer adaptations; diet and nutrition; paleoecology and paleobiology; comparative and analytical osteology; and primate behavior and ecology. The department's Laboratory of Anthropology has constituent archaeological, paleoethnobotany, faunal analysis, human biology, stable-isotope, and ethnographic laboratories.

The department is the headquarters of the Illinois Archaeological Survey and offers summer field school training in archaeology. Departmental funds are available for graduate students' summer field research. An archaeology field school is held at various locations in Illinois and/or Kentucky (location varies from year to year). Graduate student programs are enriched by close departmental relationships with the interdisciplinary area studies centers on campus: Africa, East Asia and the Pacific, South and West Asia, Latin America and the Caribbean, and Russia and East Europe, and with the Afro-American Cultural Program, Women's Studies Program, Office of Women in International Development, World Heritage Museum, Museum of Natural History, Krannert Art Museum, Research Board, and International Programs and Studies. The department recently ranked first in the United States in employment of graduates at the time of receiving doctorates. Formal agreements between the University and various governments and institutes facilitate research in many nations. Training is available in various languages, including Quechua, Japanese, Chinese, Russian, Indonesian, Thai, Burmese, Swahili, Hausa, Lingala, Wolof, Arabic, and Shona. Students have ready access to the extensive computer facilities of the University and to the department's facilities, which include microcomputers and mainframe computer terminals, a graphic digitizer, photographic equipment, video equipment, and other research-oriented equipment. The *Journal of the Steward Anthropological Society*, edited by graduate students, has been published since 1969.

ARCHITECTURE

Director of the School: R. Alan Forrester

Correspondence and Information: School of Architecture, University of Illinois at Urbana-Champaign, 106 Architecture Building, 608 East Lorado Taft Drive, Champaign, IL 61820

GRADUATE FACULTY

Professors: M.M. Ali, J.R. Anderson, J.S. Baker, A.C. Bianchini, W. Eng, R.A. Forrester, J.S. Garner, B.L. Hutchings, R.D. Katz, M.K. Kim, S.T. Lanford, W.H. Lewis, H.J. Miller, A. Notaras, W.J. O'Connell, J.H. Swing, R.L. Tavis, J.P. Warfield, H.C. White, D.J. Wickersheimer, C.A. Winkelhake

Associate Professors: J.G. Albrecht, K.H. Anthony, D.E. Bergeson, R.J. Betts, C. Dry, W.H. Erwin, L.A. Leffers, R.G. Ousterhout, R.E. Schmitt, J.E. Simon, R.L. Smith

Graduate Degree Programs. The School of Architecture offers three graduate programs, each leading to the Master of Architecture degree: Track 1, a one-year program for the student holding a five-year Bachelor of Architecture professional degree; Track 2, a two-year program for the student holding a four-year Bachelor of Science in Architectural Studies (or similar degree in architecture); and Track 3, a program of variable length for the student holding a bachelor's degree in any field other than architecture. Track 2 and Track 3 programs are professional degree programs accredited by the National Architectural Accreditation Board.

The School of Architecture, together with the Departments of Business Administration, Finance, Computer Science, Urban and Regional Planning, and Civil Engineering, offers graduate programs leading to the following dual degrees: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Finance; Master of Architecture and Master of Computer Science; Master of Architecture and Master of Urban Planning, and Master of Architecture and Master of Civil Engineering (Construction Management).

Admission. Admission with full standing requires a preprofessional architectural degree equivalent to the four-year Bachelor of Science in Architectural Studies from the University of Illinois at Urbana-Champaign or a five-year Bachelor of Architecture professional degree. The admission grade-point average must be at least 4.0 (A = 5.0). For an applicant who meets the degree requirements but has an admission grade-point average under 4.0, admission with limited standing may be permitted if evidence of exceptional qualifications is presented. Admission with limited standing may also be permitted for an applicant holding

a degree less than equivalent to a degree from the University of Illinois at Urbana-Champaign, provided that equivalency can be established through additional course work.

An applicant is ranked and selected on the basis of undergraduate academic performance measured by an admission average determined from official college transcripts, portfolio or brochure of applicant's past work in the architectural field, a statement of objectives, three letters of recommendation, and relevant professional work experience.

Master of Architecture (Track 1). An applicant who holds the five-year Bachelor of Architecture degree is considered to have earned the first professional degree. For this student, a one-year degree program has been developed emphasizing further study in depth of one optional area of concentration, and/or participation in research identical to the final phase of the Track 2 graduate program.

A candidate admitted to the Track 1 graduate program must complete at least 8 units of graduate work. The candidate must spend at least two semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in one full-time academic year of study.

Master of Architecture (Track 2). The two-year professional degree program, intended for the student entering with a four-year baccalaureate in architectural studies, emphasizes further study in architectural disciplines, study in depth in one optional area of concentration, and/or participation in research.

Advanced study in architectural disciplines, building upon the fundamentals established in a four-year undergraduate study program, comprises the initial phase of the two-year graduate program. This initial phase is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of course work required of all candidates for the Master of Architecture professional degree.

Election of an optional area of concentration comprises the final phase of the graduate program and allows a student to devote two semesters of work to a specific field of his or her choice. The department offers optional areas of concentration in architectural design, architectural history, historic preservation and rehabilitation, housing environments, architectural management, architectural practice, architectural structures, and urban design. There is a strong shared interest in environment and behavior studies with the Departments of Landscape Architecture and Urban and Regional Planning and with Housing Research and Development. An individualized area of concentration may also be pursued through an individual study option, for which a research thesis is required.

Participation in or initiation of research is encouraged in the optional areas of concentration. For those qualified, many opportunities currently exist in departmental and interdepartmental areas. These include research opportunities from the School of Architecture based on research grants from various external funding agencies; from Housing Research and Development, a unit of the Graduate College; and from the Small Homes Council—Building Research Council, a unit of the College of Fine and Applied Arts.

A candidate admitted with full or qualified standing to the two-year professional degree program must complete at least 15½ units of graduate work. The candidate must spend at least four semesters and earn at least half of the required units in residence. A candidate admitted with full standing may complete the program in two full-time academic years of study.

Master of Architecture (Track 3). The variable-length professional degree program has been designed for the applicant who has a bachelor's degree in any field other than architecture. Emphasis is placed on the development of sufficient background in introductory architectural studies so that the applicant may successfully complete the equivalent of the two-year graduate program described above.

Applicants accepted into the Track 3 program will initially be admitted with limited standing. Full standing may be attained by completion of introductory architectural studies. A minimum of 13½ units of graduate work is required for completion.

The time necessary to complete the program will depend upon the nature of undergraduate course work completed by the applicant, and the optional area selected.

Master of Architecture and Master of Business Administration, Master of Science in Finance, or Master of Computer Science. Three double master's degree programs related to the architectural management option prepare graduate degree candidates for the broad range of management activity now developing in architectural practice. Work in the architectural management option in one of these areas can lead to one of the following double master's degree combinations: Master of Architecture and Master of Business Administration; Master of Architecture and Master of Science in Finance; and Master of Architecture and Master of Computer Science.

For entry into one of these programs, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission may be made simultaneously to both units, or admission to one unit may be sought after gaining entry to the other.

A candidate entering one of these double degree programs with a four-year baccalaureate in architectural studies must complete 21½ units of graduate work, except that the combination of Master of Architecture and Master of Computer Science degrees requires 18½ units plus 9 semester hours of prerequisites in computer science. If admitted with full standing, a student can complete the program in five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters.

Master of Architecture and Master of Urban Planning. This double degree program offers an opportunity to obtain an education for a career that combines the disciplines of architecture and planning. The program requires a matchup of related subject areas from the two departments in order to meet the requirements for each degree. These areas include: housing/community development, preservation/preservation planning, and urban design/environmental planning and land use. For entry into this program, the applicant must satisfy the admission requirements of each academic unit. Application for admission may be made either simultaneously to both units or in sequence.

A candidate entering the program with a four-year baccalaureate in architectural studies must complete at least 20½ units of graduate work and, if admitted with full standing, may complete the program in six semesters and one summer session. A candidate entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters and a summer session.

Master of Architecture and Master of Civil Engineering (Construction Management). This double degree program offers the qualified applicant the opportunity to develop competence in a career that combines the disciplines of architecture and civil engineering construction management. For entry into this program, the applicant must satisfy the admission and performance requirements of each academic unit. Application for admission should be made to the School of Architecture. Admission to the other unit may be sought after the first semester of graduate study in architecture.

A candidate entering the program with a four-year baccalaureate in architectural studies must complete at least 21½ units of graduate work and, if admitted with full standing, may complete the program in five semesters. A candidate entering the program with a five-year Bachelor of Architecture degree must complete 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters.

ART AND DESIGN

(Including Art Education, Art History, Ceramics, Glass, Graphic Design, Industrial Design, Metals, Painting, Photography, Printmaking, and Sculpture)

Director: T. Zernick

Correspondence and Information: D. Pilcher, Coordinator of Graduate Programs, School of Art and Design, University of Illinois at Urbana-Champaign, 120 Art and Design Building, 408 East Peabody Drive, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.F. Blakley, W. Carlson, P. Fehl, J. Fineberg, M. Franciscono, F. Gallo, L. Grucza, F. Gunter, G.W. Hardiman, J. Kaufman, T. Kovacs, N. McFarland, H. Maguire, B. Nettles, D. Pilcher, D. Rowan, J. Savage, D. Socha, R. Sterkel, E.C. Wicks, T. Zernich, J. Ziff
Associate Professors: M. Arends, D. Bushman, K. Carls, J.D. Colley, B. DeGenevieve, S. Flack, A. Glaze, C. Martens, A. Mette, K. Munakata, S. Orso, J. Rascheff, T. Van Laar
Assistant Professors: D.J. Cox, A. Hedeman, K. Manthorne, C. Thompson

Graduate Degree Programs. The School of Art and Design offers the Master of Arts in Art Education and in Art History, the Master of Fine Arts, the Doctor of Education in Art Education, and the Doctor of Philosophy in Art History. The Graduate College admission requirements apply for all programs.

Master of Arts in Art Education. The program of study leading to the degree of Master of Arts in Art Education is designed to provide advanced professional preparation for art teachers and supervisors. A minimum of 8 units of study is required for the degree. Three units must be taken at the 400 level, all of which must be in art education graduate seminars. In addition to professional courses in art education, students may elect course work in drawing, painting, sculpture, papercasting, printmaking, photography, cinematography, ceramics, glassworking, metalsmithing, and art history. Specific course selection is determined in consultation with the student's adviser. No thesis is required. While the majority of applicants to this program hold valid teaching certificates, applicants with certification-related deficiencies may be admitted to the program. All such deficiencies must be removed before the degree is granted. However, graduate credit cannot be granted for courses taken to make up such deficiencies. Candidates must spend at least two semesters or the equivalent in residence. Applicants currently employed as teachers may apply for residence credit for summers-only enrollment.

Master of Arts in Art History. This program provides basic preparation for teaching at the college level, background in the history of art for museum work, and preliminary study for the doctoral degree. In addition to the general requirements, the prerequisite for admission is ordinarily an undergraduate degree in art history or a strong preparation in related humanistic studies. Applicants with little background in art history but who have done exceptionally well as undergraduates in other disciplines will be seriously considered. A minimum of 8 units is required for the degree. At least 6 units must be in the history of art and architecture, of which at least 4 units must be in art history graduate seminars. For those interested in art museum training, special courses in museum studies are offered by the staff of the Krannert Art Museum. Proficiency in French or German must be demonstrated by the end of the first year of residence. Before the degree is conferred, the candidate is required to pass an examination on the general field of art history. A thesis is required.

Master of Fine Arts. The degree of Master of Fine Arts in Art and Design with fields of specialization in ceramics, glass, graphic design, industrial design, metals, painting, photography, printmaking, and sculpture is designed to prepare the qualified individual for distinctive achievement in the professional area of his or her choice. An applicant should clearly indicate the intended specialization on the application for admission. A minimum of 16 units of graduate credit is required for the MFA degree. Individual studio space and specialized resources essential to the acquisition of a high-quality professional education are available to students in all areas of study. A graduation exhibition of creative work is required. Candidates must spend a minimum of four semesters or the equivalent in residence.

Admission is determined by a faculty review of portfolio, records of previous education and experience, letters of recommendation, and other significant achievements that may be viewed as predictors for success in the program.

Doctor of Education in Art Education. The program leading to the degree of Doctor of Education in Art Education is designed to prepare qualified art educators for careers in college-level teaching and research. An applicant for admission must hold a master's degree in art education or the equivalent from an accredited institution. A minimum of two years of acceptable teaching experience is required. Admission is determined by examinations,

personal interviews, records of previous education and experience, and letters of recommendation. Applicants should present credentials well in advance of their first registration. A minimum of 16 units of course work beyond the master's degree is required.

Doctor of Philosophy in Art History. The program leading to the degree of Doctor of Philosophy in Art History is designed to prepare students for scholarship and for teaching at the college level. An applicant must have the Master of Arts in Art History or the equivalent. A student earning the master's degree at the University of Illinois at Urbana-Champaign must pass the qualifying examination with a high score and write a thesis or research paper of superior quality in order to be admitted to the doctoral program. A student taking the master's degree elsewhere must satisfy the Graduate Committee on the History of Art and Architecture as to his or her preparation to undertake work on a doctoral level. Each student must have a reading knowledge of French and German. A student usually elects to specialize and write a thesis in one of a variety of fields, including medieval, Renaissance, baroque, modern, American, and oriental. In addition, the student will elect a minor in another art history field.

Financial Aid. Fellowships, assistantships, and tuition and service fee waivers are awarded each year on a competitive basis with consideration given to the applicant's grade-point average and, in the case of applicants for the MFA programs, quality of creative work.

Resources. Resources for the graduate student in art and design include the Krannert Art Museum's excellent permanent collections and changing exhibitions; the Ricker Library of Art and Architecture, one of the largest art and architecture libraries in the nation; the Krannert Center for the Performing Arts; and a variety of lectures, symposia, musical programs, dramatic productions, and other cultural events associated with a large and progressive university.

ASIAN STUDIES

(Including Arabic, Burmese, Chinese, Hebrew, Hindi, Indonesian, Japanese, Korean, Persian, Sanskrit, Thai, and Turkish)

Correspondence and Information: East Asian, Southeast Asian, and Pacific Studies: Center for East Asian and Pacific Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, IL 61801. South and West Asian Studies: Program in South and West Asian Studies, University of Illinois at Urbana-Champaign, 381 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Accad, N. Aggarwal, P. Balgopal, E. Bruner, C. Capwell, C. Cheng, S. Cohen, C. Cunningham, L. Eastman, P. Ebrey, E. Giles, J. Hill, H. Hock, T. Hymowitz, N. Jacobs, B. Kachru, Y. Kachru, B. Karsh, J. Keller, C. Kim, B. Kling, F. Lehman, G. Lim, S. Makino, C. Mulhern, A. Neghandi, B. Nettl, D. Plath, G. Porton, S. Rashid, S. Sato, P. Schran, C. Stewart, K. Taira, G. Tikku, R. Toby, M. Weinbaum, W. Wong, G. Yu

Associate Professors: B. Bognar, R. Chang, D. Desser, S. Douglas, D. Goodman, J. Haboush, R. Jennings, S. Johnson, W. MacDonald, H. Maguire, Y. Makino, K. Munakata, J. Peterson, T. Riley, M. Saul, M. Shorish, K. Southwood, M. Wagner, M. Weinstein

Assistant Professors: A. Anagnost, K. Chow, A. Elhance, P. Gregory, J. Hanes, V. Hoffman-Ladd, W. Li, R. Pandharipande, W. Pitard, G. Pope, L. Unnevehr

Graduate Degree Program. The Center for East Asian and Pacific Studies administers, in cooperation with the Program in South and West Asian Studies where applicable, a two-year program of language and area courses leading to the master of arts degree with regional concentrations in East Asia, the Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for the student intending to proceed to the PhD degree in a related field and for the student preparing for a career not requiring the doctorate. The Center for East Asian and Pacific Studies also administers a graduate

minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, the Middle East, South Asia, or Southeast Asia, or a combination of two or more of these areas.

Admission. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois at Urbana-Champaign, but final selection is determined by a committee of center faculty members. Students whose native language is not English must score at least 580 on the TOEFL to be eligible for admission at full graduate standing. An applicant must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. A student entering without any prior training or experience, however, may be required to take, without credit toward the degree, such work as the adviser may deem necessary to make up any deficiencies.

Master of Arts. A candidate must complete 9 units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by satisfactory completion of an examination or appropriate course work, pass an oral examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers. No thesis is required.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least 2 units of graduate credit in approved courses in at least two departments outside the major department.

A doctoral candidate who elects Asian studies as a minor must earn at least 4 units of graduate credit in approved courses in at least two departments outside the major department. Also, prior to the completion of course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Chair of the Department: Ronald F. Webbink
Correspondence and Information: Department of Astronomy, University of Illinois at Urbana-Champaign, 349 Astronomy Building, 1011 West Springfield Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.J. Allen, R.M. Crutcher, J.R. Dickel, I. Iben, Jr., J.B. Kaler, F.K. Lamb, K.-Y. Lo, D. Mihalas, T. Ch. Mouschovias, E.C. Olson, L.L. Smarr, L.E. Snyder, J.W. Truran, W.D. Watson, R.F. Webbink, K.M. Yoss
Associate Professors: L.A. Thompson, M. Norman
Assistant Professor: B. Mihalas
Emeritus Professors: J.H. Cahn, S. Rosen, G. Swenson

Graduate Degree Programs. The Department of Astronomy offers graduate work leading to the master of science and doctor of philosophy degrees. The goal of the graduate program in astronomy is to provide broadly based training in modern astrophysics and astronomy for a small and carefully selected student body. Individually designed programs involving close contact with faculty members are encouraged, and an understanding of fundamental principles and techniques and their applications to research problems of current interest is emphasized. Students are expected to acquire a solid knowledge of modern physics as well as of general astronomy. A major objective is to maintain an exciting intellectual environment in which students can develop their scientific creativity and their enthusiasm for astronomy.

Admission. Admission decisions are made once a year in the spring. Applications for admission and financial assistance must be received by February 15. Normal entrance requirements are a bachelor's degree in astronomy, physics, physical chemistry, or mathe-

matics, and a one-year course in descriptive astronomy. A minimum grade-point average of 4.0 (A = 5.0) and satisfactory scores on the Graduate Record Examination (verbal, quantitive, and advanced physics portions) are requisites for admission. Financial assistance is usually provided to graduate students.

Master of Science. For the MS degree, 8 units of study in graduate courses are required. There are no thesis or foreign language requirements. The 8 units of course work may not include any research units (such as 490, 497, 499) except 1 unit of 491. At least 4 units must be in astronomy 400-level courses, 2 of which will be in Theoretical Astrophysics 402 and in Observational Astronomy 403. The remaining 4 units must be selected from approved courses in astronomy, physics, or mathematics, with at least 1 of these units in a 400-level course.

Doctor of Philosophy. The PhD degree requires completion of 24 units in courses in astronomy and related fields (at least 8 of which involve individual study and research), satisfactory performance on a general qualifying examination no later than the beginning of the third year of study, demonstrated reading ability in one foreign language useful for astronomical work, and completion of an original research project culminating in a thesis publishable in whole or in part.

Financial Aid. University fellowships are available and may be combined with part-time teaching assistantships. Most resident students are supported for their first two or three years by half-time teaching assistantships (starting salary $9,245 per academic year in 1989-90). The typical teaching assistant takes three graduate courses per semester and spends twenty hours per week handling quiz sections in elementary astronomy courses. Teaching assistantships are responsible positions, and the concomitant duties are considered to be a valuable part of the student's educational experience. Advanced students may compete for research assistantships offered by faculty members whose research is partially supported by federal grants.

Faculty Research Interests. Research activity includes astrophysical fluid dynamics and theory of star formation; radiation hydrodynamics; observational and theoretical investigation of the solar system (comets, planets, cosmochronology); stars (stellar structure and evolution, gravitational collapse, nucleosynthesis, novae, supernovae, stellar atmospheres, binaries, stellar statistics, pulsars); the interstellar medium (planetary nebulae, molecular clouds, cosmic rays, supernova remnants, galactic structure); extragalactic systems (galaxies; their structure, evolution, and dynamic behavior; quasars); and cosmic magnetic fields.

Astrophysics is also a strong research interest of about six faculty members in the Department of Physics. Current activity in physics centers on the physics of neutron stars, white dwarfs, compact X-ray sources, and super-nova ejecta, with broad-ranging interests in the application of modern physics to astronomy. Students in astronomy may select thesis supervisors from faculty in the Department of Physics as well as in the Department of Astronomy.

Research Facilities. The department has a share in a millimeter radio-interferometer system in Northern California (being developed jointly with UC Berkeley and Maryland). A 40-inch–diameter reflecting telescope equipped with a CCD, located on Mt. Laguna in Southern California, is operated jointly with San Diego State University, which also operates 16-inch and 24-inch telescopes occasionally used by University of Illinois faculty and students. Transportation costs are usually provided. The department also purchases time on optical telescopes operated by other universities. Both optical and radio astronomers frequently obtain observing time on telescopes at national observatories at Kitt Peak, Cerro Tololo, Green Bank, and Socorro. Computations are performed on a variety of university computers including an IBM 4341 and Convex, accessed via remote terminals in the Department of Astronomy. Simultaneous time sharing and batch processing with unusual speed are features of the computational system, which is among the most advanced university-based systems in the nation. A local area network (LAN), including VAX and SUN computers for interactive image processing, is available in the department. This LAN also provides access to the CRAY at the National Center for Supercomputing Applications on the campus; this computer is

used for production data processing (radio synthesis imaging) as well as theoretical modeling.

ATMOSPHERIC SCIENCES

Head of Department: M. Mak
Correspondence and Information: Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, 102 Atmospheric Science Building, 105 South Gregory Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: K.V. Beard, P.J. Lamb*, M. Mak, T. Sasamori, M. Schlesinger, R.G. Semonin*, J.E. Walsh, R.B. Wilhelmson
Assistant Professors: K.P. Bowman, M. Ramamurthy, R.M. Rauber, W.A. Robinson
Emeritus Professor: Y. Ogura

**Adjunct faculty from Illinois State Water Survey*

Graduate Degree Program. Graduate programs leading to the master of science and doctor of philosophy degrees are offered.

Admission. Applications for admission to this program must satisfy the general requirements for admission to the Graduate College. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied mathematics. There is no foreign language requirement.

Master of Science. The requirements for the degree of Master of Science in Atmospheric Sciences correspond to the general requirements of the Graduate College for the MS degree with the additional requirement of a minimum of 4 units to be taken in graduate courses in atmospheric sciences, excluding the thesis (499). Therefore, the total requirements are 8 units, 3 of which must be from courses numbered in the 400 series and 4 of which must be in atmospheric sciences. A written thesis, which may account for 1 or 2 units of credit, is also required. Further information on exact degree requirements can be obtained from the department.

Doctor of Philosophy. All candidates for the PhD degree must satisfy the general requirements of the Graduate College and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet that may be obtained from the department.

Financial Aid. Financial aid is available in the form of research and teaching assistantships, University fellowships, and waivers of tuition and service fees.

Research Interests. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the physics of aerosol and precipitation; precipitation chemistry; observational, theoretical, and modeling studies of clouds and severe storms; synoptic and mesoscale meteorology; numerical weather prediction; weather modification; four-dimensional data assimilation; stratospheric dynamics; low-frequency variability; nonlinear atmospheric dynamics; climate variability and climate modeling; monsoonal circulations; polar meteorology and oceanography; tropical meteorology; atmospheric radiative processes; ozone climatology; radar and satellite meteorology; and relationships between crop yield and weather.

Research Facilities. Current weather information is available for teaching and research. Weather facsimile charts are received continuously from the National Weather Service, and satellite imagery is received hourly through the department's UNIFAX II GOES receiver.

The department has excellent computing facilities. The primary departmental computer is a Hewlett-Packard 835S, which is a high-performance minicomputer with a graphics accelerator and high-resolution color display. The HP-835S is used for general-purpose computing and data display. The secondary departmental computer is a DEC micro VAX-II. It is used principally for collecting, analyzing, and displaying real-time weather data for teaching and research. Laser printers and color film recorders are available for output. The department also has a large number of terminals, Macintosh personal computers, and workstations available to students and faculty. All of the computers in the department are connected to the departmental network and to a high-speed, campuswide, fiber-optic network. It provides access to other computers on and off campus, such as those operated by the University (an IBM 3081 and a CONVEX 220) and those operated by the National Center for Supercomputing Applications (Cray-XMP, Cray-2, and a Connection Machine) located on campus. The campus network also has satellite and land links to national and international networks, including the computing facilities of the National Center for Atmospheric Research (NCAR). NCAR maintains two Cray supercomputers and has comprehensive atmospheric data sets for support of research.

BIOENGINEERING

Correspondence and Information: Bioengineering Office, University of Illinois at Urbana-Champaign, 164 Mechanical Engineering Building, 1206 West Green Street, Urbana, IL 61801

At this time there is no graduate degree offered in bioengineering. However, courses and research opportunities are currently offered in the following units: chemical engineering, electrical and computer engineering, general engineering, kinesiology, materials science and engineering, mechanical and industrial engineering, the College of Medicine, physiology and biophysics, rehabilitation education, theoretical and applied mechanics, veterinary biosciences, veterinary clinical medicine. Students interested in bioengineering graduate work should contact either the Bioengineering Office or the degree-granting department most nearly matching their interests.

BUSINESS ADMINISTRATION

Head of the Department: Frederick W. Winter

Correspondence and Information: PhD and MSBA: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820. MBA: MBA Program Office, University of Illinois at Urbana-Champaign, 315 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: C.E. Blair, R. Engelbrecht-Wiggans, R.V. Evans, D.M. Gardner, R.M. Hill, H. Hinomoto, A.S. Huff, J.W. Kindt, J.K. Murnighan, A.R. Negandhi, G.R. Oldham, D.M. Roberts, K.M. Rowland, S. Sudman, H. Thomas, D.A. Whetten, F.W. Winter

Associate Professors: S.I. Cohen, I.H. Duhaime, H. Leblebici, G.E. Monahan, J.F. Porac, Z. Ritz, M.E. Roszkowski, M.J.P. Shaw, D. Sudharshan

Assistant Professors: A.K. Basu, L. Buchanan, D. Chhajed, J. Goodstein, R. Hill, M.L. Leatherwood, J. Mahoney, N. Raman, P. Rechner, C. Simmons, M. Tang, J. Yu

Graduate Degree Programs. The Department of Business Administration offers the Master of Science in Business Administration (MSBA) and the Doctor of Philosophy (PhD) in Business Administration. The College of Commerce and Business Administration offers a degree program leading to the Master of Business Administration (MBA). Joint professional degrees are offered with Architecture (MArch/MBA), Law (JD/MBA), Medicine (MD/MBA),

Engineering (MSEE/MBA, MSIE/MBA, MSME/MBA, MSGE/MBA), and Computer Science (MCS/MBA).

Admission. Admission to the graduate business programs is dependent upon an undergraduate degree with a scholastic average of at least B for the last 60 hours, acceptable scores on the Graduate Management Admission Test (GMAT), three letters of recommendation, and a statement of career goals. The average GMAT for the fall 1989 MBA class was 600; the average grade-point average was 4.4 (A = 5.0).

Applicants for all programs whose native language is not English are also required to submit scores from the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE). A minimum score of 600 must be achieved on the TOEFL; a minimum score of 220 on the TSE.

The master's programs can be started in August only. The PhD program may be started in August or January; however, August is the preferred semester of entry. The application deadline is May 1 for the MBA program, March 15 for the MSBA and August PhD programs, and October 1 for January PhD admission.

Master of Business Administration. The MBA degree is a general degree, the purpose of which is to prepare graduates to assume managerial positions. This course of study is to be integrated with other technical and professional skills. The program requires 18 units, which can be completed in two years. The program always begins in the fall semester and is offered on a full-time basis only. Although students may have undergraduate degrees from any area of study, a nonbusiness background is preferred.

The eighteen-course program is composed of twelve core courses (six from the fundamental areas of behavioral, economic, and quantitative sciences; six from the functional areas of accounting, marketing, finance, production, operations, law, and policy and planning); and six electives. No evening or correspondence courses are offered. No exemptions or transfer credit is allowed.

Students may select electives from one specific area or a number of different areas. Some suggested elective areas include decision and information sciences, international business, finance, marketing, accounting, organizational behavior, entrepreneurship, and strategy and policy. In addition, three new elective areas have been added: health-care management, agribusiness, and the management of technology.

All MBA students must complete a semester-long, noncredit computer competency sequence offered through the Office for Information Management. The sequence is offered on Fridays during the fall semester of the first year. Students are provided with hands-on training in management tools of the profession, such as electronic mail, word processing, spreadsheet, data base management, and business graphics.

All MBA students must also attend weekly noncredit oral and written skills development workshops. These are offered on Fridays during the spring semester of the first year. The written communication workshops focus on memo, report, and resume writing. The oral communications workshops include sessions on active listening, problem solving, job-interviewing strategies, and making formal presentations.

A two-year Executive MBA program is offered to experienced managers. Details may be obtained from the Executive MBA Program, 218 Commerce West, 1206 South Sixth Street, Champaign, IL 61820.

Juris Doctor and Master of Business Administration. The JD/MBA program promotes those careers in which administration and law overlap, such as corporate and trust law. Students in this program will complete at least 74 hours of law courses and 12 units of business courses. For more information on the JD degree, write to Admission Officer, 207 Law Building, 504 East Pennsylvania Avenue, Champaign, IL 61820.

Master of Architecture and Master of Business Administration. The MArch/MBA program is designed to provide training for careers in which management and architecture overlap. This joint program enables students to fulfill the requirements for both degrees by completing a total of 21½ units. Twelve of these units are in business administration. For more information on this degree, write to Graduate Admission Officer, 117 Architecture Building, 608 East Lorado Taft Drive, Champaign, IL 61820.

Doctor of Medicine and Master of Business Administration. The MD/MBA program is designed for medical doctors who anticipate administrative responsibilities. In addition to the requirements for the MD degree, the program requires 12 units in business administration. Students can finish the program in four full years, including three summers. For more information on the Medical Scholars Program, write to Coordinator of the Medical Scholars Program, 1210 West California Street, Urbana, IL 61801.

Master of Science in Electrical Engineering and Master of Business Administration. The MSEE/MBA program encourages careers in professional engineering and the management of technology. Students in the joint program must complete a total of 18 units, 14 of which are in business administration. For more information, write to Admission Officer, Department of Electrical and Computer Engineering, 155 Electrical Engineering, 1406 West Green Street, Urbana, IL 61801.

Other Engineering Joint Degree Programs. The Master of Science in Industrial Engineering/Master of Business Administration program (MSIE/MBA), the Master of Science in Mechanical Engineering/Master of Business Administration program (MSME/MBA), and the Master of Science in General Engineering/Master of Business Administration program (MSGE/MBA) were created in response to a growing demand for industrial, mechanical, and general engineers who are also professional managers. The MSIE/MBA and MSME/MBA programs require a total of 20 units, 12 of which are in business administration. The MSGE/MGA program requires 18 units, 12 of which are in business administration. For more information on the MSIE/MBA or MSME/MBA, write to Graduate Programs Office, 210a Mechanical Engineering Laboratory, 1206 West Green Street, Urbana, IL 61801. For more information on the MSGE/MBA, write to Graduate Admissions, 117 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801.

Master of Computer Science and Master of Business Administration. The MCS/MBA allows students to earn both degrees in three years instead of the usual four. The program serves the application-minded computer scientist who needs management skills. Requirements include 12 units from business administration and 9 units from computer science. For more information, write to Graduate Admissions, 114 Digital Computer Laboratory, 1304 West Springfield Avenue, Champaign, IL 61820.

Bachelor of Arts in Liberal Arts/Master of Business Administration and Bachelor of Arts in Agriculture/Master of Business Administration. These programs allow students to earn two degrees in five years rather than the usual six. The programs integrate an undergraduate education with a professional education without diluting the quality or purpose of either. Through careful course selection and program planning, students begin to take 400-level courses during their senior year. These courses count toward both degrees. For more information on the BA in Liberal Arts/MBA program, write to 270 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801. For more information on the BA in Agriculture/MBA program, write to 101 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801.

Master of Science in Business Administration. The Master of Science in Business Administration is a 10- to 12-unit master's program best suited for those with a strong technical expertise in one of the concentrations offered within the PhD program. The focus is on preparation for advanced study in the doctoral program or for a research-oriented position. The course work can usually be completed in four semesters. The program core consists of three areas of study: quantitative methods, behavioral science, and economics. These courses integrate, in the major functional areas, contributions of the qualitative, social, and behavioral sciences to administrative decision making. A major must be specified from one of five areas offered within the Department of Business Administration: organizational behavior, business policy, marketing, international business, and decision and information science. A minor is required as well and can be chosen from another area within the Department of Business Administration or a related area outside the department or college. Admission to the program is highly selective.

Master of Science in Business Administration for International Managers. The MSBA for International Managers is a fourteen-month master's degree program designed to meet the management development needs of organizations involved in international business. It is intended for experienced international managers and administrators who want to earn an advanced degree while gaining valuable experience in the world of American business. Students typically are experienced managers who possess unusual potential for future achievement in international business. Those who wish to specialize in a functional area may extend their program to two years.

In addition to formal course work, students participate in a series of management development seminars, which provide an overview of American business concepts and practices. Business and industry field trips, seminars with American executives, and other special activities provide another dimension to the program. A conference at which students present papers on topics of special interest is held at the conclusion of the program.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration. Doctoral students can specialize in marketing, organizational behavior, decision and information sciences, international business, and strategic management and policy. The program is intensive, flexible, and adapted to individual needs.

Each student's program entails sufficient study and preparation to achieve the following: (1) competence in a common core covering substantive and research methods courses, which are formulated by the faculty in each area; (2) in-depth expertise in a major area; (3) expertise in at least one area in addition to the chosen major area, with this minor area selected from within or outside the department; (4) teaching competence; (5) research or problem-solving competence.

Competency is determined by comprehensive written and/or oral examinations. Following successful completion of all course work and comprehensive examinations in major and minor areas, the student must propose and gain approval of a thesis topic at a public colloquium. The final program requirement is the successful oral defense of the thesis.

For persons entering the program from an undergraduate program, the minimum requirements are 16 course units and 8 thesis units. Persons entering with a master's degree in business generally will need a minimum of 8 course units and 8 thesis units. The program usually is completed in four years, although students with a master's degree in business may require only three years.

International Programs. The department has worked with various language and social science faculty members to design master's and doctoral program options that address education for the growing internationalization of business. These are suited particularly for undergraduates prepared in foreign languages and cultures, international economics, and politics.

Residence Requirement. Master's degree candidates must maintain continuous full-time registration through the completion of their course work. PhD candidates must maintain continuous registration through the approval of a dissertation proposal, unless a leave has been approved by the department.

Financial Aid. One fellowship and a small number of scholarships are offered to first-year MBA students. Because of the heavy course load, first-year MBA students are not permitted to hold assistantships. Many MBA students receive teaching or research assistantships during their second year.

Most PhD students receive some form of financial assistance. This assistance is likely to be in the form of a teaching or research assistantship, which includes a waiver of tuition and most service fees, and/or the award of a merit-based fellowship.

Research Interests. Faculty research interests are in the areas of marketing, organizational behavior, decision and information sciences, strategic planning and business policy, international business, accounting, economics, entrepreneurship, and finance. The College of Commerce and Business Administration houses computer facilities, a behavioral science laboratory, and a separate library, and maintains contacts with industry and government through its

Executive Development Center, Executive-in-Residence Program, Survey Research Laboratory, Bureau of Economics and Business Research, and several professional and scholarly journals edited by its faculty.

CHEMICAL PHYSICS

Head of the Department of Chemistry: Larry R. Faulkner
Head of the Department of Physics: Ansel C. Anderson
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head, Department of Physics, University of Illinois at Urbana-Champaign, 211 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, IL 61801.

Graduate Degree Programs. A chemical physics program leading to the doctor of philosophy makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Fundamental research on many properties of molecular and solid-state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission. Graduate College admission requirements apply. To be considered for admission, applicants should have undergraduate degrees in chemistry or physics with a strong background in the major field of chemistry or physics and more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study.

Doctor of Philosophy. In addition to taking a series of appropriate courses determined mainly by their research interests, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). In addition, students must pass an oral preliminary examination concerned with their preparation for doing research. Research for the thesis is performed under the direction of faculty members who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from the Departments of Physics, Chemistry, Metallurgy, Ceramic Engineering, Electrical Engineering, and other related departments that have common interests in materials science.

Financial Aid. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School: Jiri Jonas
Associate Director of the School: John P. Hummel
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of master of science and doctor of philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments and yet retain the advantages of a common approach to overlapping concerns. Service facilities, technical shops, and a placement office are provided by the school. Support for graduate training is available in the form of assistantships, traineeships, and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department or from the director of the school.

Biochemistry

Head of the Department: Robert L. Switzer

Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 401 Roger Adams Laboratory, 1209 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.M. Clark, Jr., J.E. Cronan, R.B. Gennis, M. Glaser, R.I. Gumport, L.P. Hager, A.F. Horwitz, A.M. Jonas, D.J. Shapiro, S.G. Sligar, R.L. Switzer

Associate Professors: G.W. Ordal, M.A. Schuler

Assistant Professors: A.S. Belmont, J.A. Kaput, T.L. Karr, D.M. Kranz, J. Widom, J.A. Wise

Graduate Degree Programs. The Department of Biochemistry offers graduate work leading to the master of science and the doctor of philosophy degrees. For an application and departmental materials that provide greater detail on programs, offerings, admission, degree requirements, and financial aid, write to the above address.

Admission. Candidates for admission to the MS and PhD programs must have bachelor's degrees from accredited institutions equivalent to those from the University of Illinois at Urbana-Champaign. Courses required for admission are organic and physical chemistry, biology, a year of physics, and mathematics through calculus. Students with a weakness in any of these areas may be required to make up deficiencies during the course of their graduate study. A grade-point average of 4.0 or higher (A = 5.0) for the last 60 hours of undergraduate work and for any graduate study is required for admission. It is strongly recommended that students take the Graduate Record Examination (both the aptitude test and the advanced test in chemistry or biology). Emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. Specific degree requirements for the Course Work and Thesis MS degrees in Biochemistry include the successful completion of 4½ units of biochemistry courses. A course work master's degree requires a minimum of two full-time semesters and involves 8 total units of formal lecture and laboratory course work. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. A thesis master's degree usually requires a minimum of three semesters, and up to 3 of the 8 required units may be thesis research. Undergraduate makeup-level courses in organic and physical chemistry are not usually accepted for credit toward fulfilling the degree requirements, although partial credit may be received for physical chemistry.

Doctor of Philosophy. Specific degree requirements for the PhD in Biochemistry include the successful completion of 4½ units of biochemistry courses. An additional 3½ units of advanced elective courses are also required for a minimum of 24 units including thesis credit. Students must also pass an oral research qualifying examination within the first eighteen months of residence, and successfully complete a series of written cumulative examinations. A thesis based on original research must be presented to a review committee at least two weeks before the final oral examination. The final examination is limited to a defense of the thesis research. Experience in teaching is considered a vital part of the graduate program and is required as a part of the academic work of all PhD candidates in this department. There is no foreign language requirement for the PhD degree in biochemistry.

Financial Aid. Financial aid for graduate students in biochemistry is available in the form of fellowships, teaching and research assistantships, tuition and partial fee waivers, and traineeships. A training grant from the National Institutes of Health supports a multidisciplinary training program. Qualified candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally receive a full tuition waiver and a partial fee waiver, as well as a stipend.

Research Interests. The Department of Biochemistry is composed of faculty members whose research interests cover the major areas of current biochemical research.

Chemical Engineering

Head of the Department: R.C. Alkire

Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 114 Roger Adams Laboratory, 1209 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.C. Alkire, H.G. Drickamer, T.J. Hanratty, R.I. Masel, W.G. May, A.J. McHugh, J.W. Westwater

Associate Professors: J.J.L. Higdon, M.A. Stadtherr

Assistant Professors: E.G. Seebauer, F.B. van Swol, K.D. Wittrup, C.F. Zukoski

Graduate Degree Programs. The Department of Chemical Engineering offers graduate work leading to the master of science and the doctor of philosophy degrees. Those interested should write to the address above for application materials and a departmental brochure, which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois at Urbana-Champaign. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with the understanding that their deficiencies will be removed to the extent prescribed by their advisers. Graduate College admission requirements also apply.

Master of Science. Requirements for the master of science include 8 units of graduate credit and a thesis. At least 5 of these units must be in courses other than thesis research; 2 of the 3 required 400-level units must be in chemical engineering courses.

Doctor of Philosophy. Requirements include 24 units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test usually taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: Larry R. Faulkner

Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Beak, R.L. Belford, T.L. Brown, R.M. Coates, S.E. Denmark, C.E. Dykstra, L.R. Faulkner, H. Frauenfelder, R.B. Gennis, H.S. Gutowsky, J.P. Hummel, J.Jonas, J.A. Katzenellenbogen, W.G. Klemperer, P.C. Lauterbur, J.D. McDonald, E. Oldfield, I.C. Paul, W.H. Pirkle, T.B. Rauchfuss, K.L. Rinehart, K. Schulten, G.B. Schuster, D.H. Secrest, J.R. Shapley, S.G. Smith, P.G. Wolynes

Associate Professors: P.W. Bohn, D.D. Dlott, G.S. Girolami, J.M. Lisy, T.A. Nieman, A. Scheeline, K.S. Suslick, A. Wieckowski

Assistant Professors: A.J. Gellman, A.A. Gewirth, E.N. Jacobsen, S.D. Kahn, P.A. Shapley, J. Widom, S.C. Zimmerman

Graduate Degree Programs. The degrees offered in chemistry are the Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. This catalog also provides information on a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 71) and on programs in biophysics (see page 123).

Admission: Students who have fulfilled the usual undergraduate course requirements, including at least 25 properly distributed semester hours in chemistry, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. A student who has completed graduate work in chemistry at another institution may be considered for admission if averages of 4.0 (A = 5.0) have been earned in both undergraduate and graduate work, or if a 4.25 average has been earned in at least 8 units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the teaching of chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree.

Master of Science in the Teaching of Chemistry. Candidates for the Master of Science in the Teaching of Chemistry must earn 4 units of credit in chemistry, 2 units in education, and 2 units of electives in either education or physical science. The 2 units in education consist of courses in educational policy studies and educational psychology (see page 84). The courses in chemistry and the electives must be selected with the approval of the adviser. No thesis is required. Questions concerning the Teaching of Chemistry Program should be addressed to Professor D.H. Secrest, 155 Noyes Laboratory.

Master's Programs in Chemistry. Eight units of credit are required for the master's degrees. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A research thesis is optional. If a thesis is elected, 5 units of formal courses are required. If a thesis is not elected, an additional 3 units of formal courses are required. The course program in that case must include 3 units of 400-level courses, 2 of which must be in chemistry.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties, including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. A total of 24 units including thesis credit is required. The formal course requirements involve 2½ to 3½ units of 400-level courses in the major area of interest and 2 to 3 units in allied areas or fields. Besides completing formal course work, a student is required to pass a series of written cumulative examinations, pass an oral preliminary examination on research preparation, and submit a thesis on original research, which is defended at a final oral examination. (Majors in organic chemistry must also demonstrate a reading knowledge of German.) Although teaching is not a general Graduate College requirement, this department requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic

training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

Financial Aid. Support for graduate students is available through fellowships and assistantships. All candidates are considered for these upon application. Graduate students making normal progress toward their degree generally receive a tuition waiver as well as a stipend.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering and Environmental Science in Civil Engineering)

Head of the Department: W.J. Hall

Correspondence and Information: Head, Department of Civil Engineering, University of Illinois at Urbana-Champaign, 1114 Newmark Civil Engineering Laboratory, 208 North Romine Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: A.H.-S. Ang, E.J. Barenberg, R.L. Berger, L.T. Boyer, E.J. Cording, M.I. Darter, B.J. Dempsey, R.S. Engelbrecht, R.A. Eubanks, B.B. Ewing, D.A. Foutch, W.L. Gamble, J. Ghaboussi, G.R. Gurfinkel, W.J. Hall, J.D. Haltiwanger, A.J. Hendron, M. Herrin, H.M. Karara, N. Khachaturian, R.W. Larimore, F.V. Lawrence, Jr., J. Lefter, J.C. Liebman, L.A. Lopez, W.H.C. Maxwell, J.W. Melin, G. Mesri, J.P. Murtha, D.A.W. Pecknold, J.T. Pfeffer, B.E. Rittmann, A.R. Robinson, W.C. Schnobrich, V.L. Snoeyink, M.A. Sozen, J.E. Stallmeyer, M.T. Suidan, W. Tang, M.R. Thompson, Y.K. Wen, H.G. Wenzel, K.W. Wong, B.C. Yen, J.F. Young

Associate Professors: D.P. Abrams, S.H. Carpenter, R.H. Dodds, J.W. Eheart, R.B. Haber, E.E. Herricks, K.D. Hjelmstad, R.A. Larson, S.L. Paul, A.J. Valocchi, W.H. Walker

Assistant Professors: R.F. Benekohal, M.M. Clark, M. Garcia, J. Garrett, K.D. Hjelmstad, A.M. Ioannides, S. Larson, J.H. Long, I.D. Parsons, M. Rood, D.T. Shaw, L.J. Struble, S.L. Wood

Graduate Degree Programs. The Department of Civil Engineering offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering. The department also offers a joint degree: the Master of Science in Architecture and Civil Engineering (construction option).

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution; analysis and design of structures; application of artificial intelligence and expert systems techniques; aquatic ecology; behavior of structures; construction engineering and management; digital computer applications to analysis and design; engineering risk, decision, and reliability analysis; environmental chemistry; environmental engineering or environmental science; environmental system analysis; geodetic engineering; highway engineering; hydrosystems engineering; hydrology, water resources, hydromechanics, and hydraulic structures; materials engineering; models research; nuclear structural shielding; ocean engineering; ocean structures; pavement design; photogrammetry; properties of structural materials: concrete, steel, timber, and others; rock mechanics; soil mechanics and foundation; solid-waste management; stochastic structural dymanics and random vibration; stream analysis; structural dynamics; design for earthquake, shock, blast excitation, and ocean waves; structural mechanics; system analysis and design; transportation engineering; urban planning and management; water quality and treatment. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois at Urbana-Champaign, provided the applicant's preparation is appropriate to advanced study in his or her chosen major field. For additional information, see the department pamphlet *Graduate Study and Research in Civil*

Engineering and in Environmental Engineering or Environmental Science in Civil Engineering. In general, a 4.0 grade-point average (A = 5.0) for the last 60 hours of the undergraduate program and for any previous graduate work is a minimum requirement for admission to the MS program. Requirements for admission to the PhD program are variable, but are usually substantially higher. The Graduate Record Examination is not required but is highly recommended.

Master of Science. A master's program may be completed in one full-time academic year of study. A candidate for the master's degree must complete at least 9 units without a thesis or 8 units with a thesis. In the latter case, credit is given for thesis work. Three of the units must be in courses numbered in the 400 series, and 2 of these 3 must be taken for grades in the major field. A total of at least 4 units must be in the major field. There are no specific course requirements; individual programs are developed by the student in consultation with his or her academic adviser. At least half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign campus, or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought. Although under certain conditions a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time, usually such students require an additional semester. There are no foreign language requirements in the MS program. The joint Master of Science with Architecture degree requires a minimum of 19½ units with a thesis and 20½ units without a thesis and can be completed in five semesters of full-time studies.

Doctor of Philosophy. The degree of doctor of philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. A minimum of 24 units beyond the bachelor's degree or 16 units beyond the master's degree is required. In accordance with Graduate College regulations, 16 units must be completed in residence. The major area of specialization encompasses courses and research that are closely related, but the courses need not necessarily be offered by a single major department. There is no departmentwide foreign language requirement. However, the faculties of some areas of specialization may require foreign language proficiency if essential to the conduct of research in that area. The candidate must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

Financial Aid. Financial aid is available in the form of fellowships, research and teaching assistantships, and tuition and partial fee waivers.

Research Centers. Two interdisciplinary research centers administered by the Department of Civil Engineering are the Advanced Construction Technology Center, which concentrates on studies of construction material, nondestructive evaluation, computer-aided construction, and special technologies; and the Center for Cement Composite Materials, which is devoted to developing new cement-based, high-strength materials. The Advanced Environmental Control Technology Research Center, which resides in the department, addresses problems associated with the technologies of environmental quality control, specifically issues in air and water resources. Other continuing efforts include the Fracture Control Program and the Materials Processing Consortium.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Chair of the Department: J.J. Bateman

Correspondence and Information: Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.J. Bateman, G.M. Browne, W.M. Calder III, H.H. Hock, H. Jacobson, M. Marcovich, J.K. Newman, D. Sansone, W.R. Schoedel, L. Zgusta
Associate Professor: J.A. Dengate
Assistant Professors: M.G. Parca, J.C. Relihan

Graduate Degree Programs. The Department of the Classics offers graduate work leading to the Master of Arts in Classics, Latin, Greek, and the Teaching of Latin, and the Doctor of Philosophy in Classical Philology. Although the graduate program is designed to provide a thorough education in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including papyrology, Byzantine and Renaissance authors); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, ancient philosophy, and classical linguistics. A statement of "Regulations for Advanced Degrees in the Classics" and special programs for prospective secondary school teachers may be obtained from the department office.

Admission. In addition to meeting the admission requirements of the Graduate College, applicants for admission to graduate study in the classics curriculum must ordinarily present at least 20 hours in either Greek or Latin and 15 hours in the other language; candidates for admission to the Greek or Latin curriculum must ordinarily present at least 20 hours in that language. Previous work in ancient history, ancient art and archaeology, philosophy, literary criticism, or linguistics is desirable.

Master of Arts. The master of arts may be taken in classics, Greek, Latin, or the teaching of Latin. Candidates for this degree must complete 8 units of course work. For the AM in Classics: 6 units of Greek and Latin, with at least 2 units in each language and at least 3 units at the 400 level (excluding 400-401); 2 units of electives; and sight-translation examinations in both languages. For the AM in Greek (Latin): 5 units in Greek (Latin) with at least 3 units at the 400 level; 3 units of electives; and sight-translation examination in Greek (Latin). With the consent of the student's adviser, up to 2 units of thesis research may be counted toward elective credit for the AM in Classics, Greek, or Latin. For the AM in the Teaching of Latin: 4 units of Latin, including 3 units at the 400 level; 2 units of education courses; and 2 units of appropriate electives.

Doctor of Philosophy. The doctor of philosophy is offered only in classical philology, which requires advanced work in both Greek and Latin. Candidates for the PhD program are eligible for acceptance upon completion of the master's degree in classics or its equivalent. Once admitted, they must complete at least 16 additional units. These include 6 units in Greek and Latin, with at least 2 units in each language and at least 5 at the 400 level, 2 units of appropriate electives, and 8 units of thesis research. The department requires a reading knowledge of two ancillary languages, German and (usually) French. Knowledge of one of these must be demonstrated at the time of admission to Level II and the other before the start of the second year at Level II. Admission to the thesis level requires passing examinations in Greek and Latin sight-translation, the history of Greek and Latin literature, and a special author as well as the preliminary oral examination.

Financial Aid. Teaching assistantships and University fellowships are available for the academic year and summer session.

Research Interests. Two periodicals are edited in the department: *Illinois Classical Studies* and *Journal of Coptic Studies.*

Resources. The separate Classics Library has about 45,000 titles. The University of Illinois Library's Rare Book Room houses the Turyn Archive of Greek manuscript photographs and the American Center of the International Photographic Archive of Papyri. The Krannert and World Heritage Museums have outstanding collections of ancient vases and other artifacts. The department has an Ibycus Scholarly Computer with a TLG CO-ROM disk.

COMMUNICATIONS

Dean of the College of Communications: James W. Carey
Chair of the Graduate Committee: Clifford G. Christians
Correspondence and Information: Chair, Graduate Committee in Communications, University of Illinois at Urbana-Champaign, 222b Armory, 505 East Armory Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: W.F. Brewer, J.W. Carey, C. Christians, J.G. Delia, N. Denzin, M.E. Fishbein, T. Guback, H. Maclay, R. Merritt, K.B. Rotzoll, E.A. Wartella
Associate Professors: L.G. Grossberg, P. Treichler, D.C. Whitney
Assistant Professors: S. Braman, J. Nerone
Emeritus Professors: J.W. Jensen, C.E. Osgood, T. Peterson

Graduate Degree Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences supported by the humanities, fine and applied arts, and natural sciences to the basic problems of human communications. It is intended for students who plan careers in teaching such communications subjects as journalism, radio-television, and media studies; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Doctor of Philosophy. The PhD program requires a minimum of 24 units beyond the bachelor's degree. Students working toward a PhD degree usually require from three to five years to complete their work. A full-time student entering the program directly after receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a thesis. Full-time students entering with a master's degree should expect to take a minimum of one year of course work before embarking on the thesis. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the thesis. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism or Advertising or in one of the departments in the social sciences.

COMPARATIVE LITERATURE

Acting Director of the Program: Michael Palencia-Roth
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W. Hollerer, H. Knust, J. Marchand, M. Palencia-Roth, G. Tikku
Associate Professor: J. Smarr
Assistant Professor: W.-Y. Li
Emeritus Professors: A.O. Aldridge, F. Jost

Graduate Degree Programs. The program in comparative literature offers graduate work leading to the degrees of master of arts and doctor of philosophy and is designed to provide a systematic study of subjects and problems common to several literatures. Its purpose is to

enable students who have varied linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and the relations between literature and the other arts.

Admission. In addition to meeting the Graduate College admission requirements, a student entering the program should have an undergraduate major in English, the classics, or a foreign language. Majors in history and philosophy may be accepted with the special consent of the director of the program. For applicants to the PhD curriculum, the AM will function as the qualifying test. Students entering with an AM degree from another university or from another department of this University will take the comparative literature component and a literary component of this program's regular master of arts examination at the end of the first year as a qualifying test.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or Neoclassicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the Program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for languages that may not be taught in regular departments.

The candidate must complete 8 units of credit, including two courses in theory of literature (Comparative Literature 401 and 402) and two seminars in comparative literature selected from Comparative Literature 451, 461, 471, and 481; the other 4 units should be taken in two or three national literatures in a distribution approved by the adviser; at least 5 of 8 units must be in courses at the 400 level. The candidate must pass a written examination based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text.

Doctor of Philosophy. A candidate for the doctor of philosophy degree must fulfill the general requirements of the Graduate College in addition to those specified above for the master's degree. Competency must be demonstrated in at least three foreign languages as well as in English. These three languages will coincide with those vital to the student's thesis and area of specialization. At least 5 units will consist of comparative literature seminars. Three additional units of work at the 400 level should be taken in courses regularly offered by the literature departments; among these, courses crosslisted with the Program in Comparative Literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student also selects a period of major interest and is responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be the Middle Ages, Renaissance, Neoclassicism, and the Enlightenment, or the modern (nineteenth and twentieth centuries). Some chronological variations in coordinating the minors will be allowed for students concentrating on East/West relations. A preliminary examination, a four-part written examination based on the individual program, and an oral examination with emphasis on the thesis project must be passed. The candidate must present an acceptable thesis embracing several national literatures and pass a final oral examination on the thesis.

Financial Aid. A limited number of University fellowships, tuition and service fee waivers, and teaching assistantships, in cooperation with other departments, is available.

COMPUTER SCIENCE

Head of the Department: C.W. Gear

Correspondence and Information: Academic Office, 252 Digital Computer Laboratory, Department of Computer Science, University of Illinois at Urbana-Champaign, 1304 West Springfield Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.G. Belford, R.H. Campbell, M. Faiman, W.J. Kubitz, D. Kuck, D.H. Lawrie, A. Levy, C.L. Liu, J.W.-S. Liu, D. Muller, S. Muroga, S.R. Ray, E.M. Reingold, A.H. Sameh, R.D. Skeel

Associate Professors: G. DeJong, N. Dershowitz, H. Edelsbrunner, K.D. Forbus, H.G. Friedman, Jr., M.T. Harandi, S.N. Kamin, T. Kerkhoven, M.D. Mickunas, D. Reed, P.E. Saylor

Assistant Professors: G. Agha, A.B. Baskin, P. Emrath, A.M. Frisch, K.A. Gallivan, E. Gallopoulos, E. Golin, W.J. Harrod, R. Johnson, L.G. Jones, L.V. Kale, S. Kaplan, D.W. Knapp, K.-J. Lin, P. Ng, D. Padua, L. Pitt, J. Ponce, U. Reddy, L.A. Rendell, F. Saied, R.E. Stepp III, P. Vaidya, A.V. Veidenbaum, D.C. Wilkins, M.S. Winslett, P. Yew

Graduate Degree Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science in Computer Science, Doctor of Philosophy in Computer Science, Master of Science in the Teaching of Computer Science, and a professional degree, Master of Computer Science. Areas of specialization include analysis of algorithms and theory of computation, combinatorics, computer-aided instruction, computer applications in physical and social sciences, computer networks, computer inference and machine learning, computer organization, design automation, digital computer arithmetic, digital systems design, display systems, hardware systems design, information retrieval, knowledge-based systems, microprocessor applications, numerical analysis, pattern recognition, programming languages, software systems, and switching theory.

Admission. An applicant must hold a bachelor's degree equivalent to that granted by the University of Illinois. The grade-point average (GPA) for the last 60 semester hours (junior and senior years) of undergraduate course work must be at least 4.0 (A = 5.0). If an applicant also holds a higher degree, the GPA for that must also be at least 4.0. Applicants must submit their scores on the Graduate Record Examination (GRE) general test. In addition, the following course background, while not mandatory, is strongly recommended: 10 semester hours of analytical geometry and calculus, 3 hours of linear algebra, 3 hours of probability and statistics, and an introductory computer science course involving programming in a block-structured language. Some promising applicants who lack a few of these requirements may be admitted on limited status, a classification that is removed once they demonstrate satisfactory progress toward their degrees. In addition to these basic entrance requirements, applicants to the MS and PhD programs should have had the equivalent of 20 semester hours in a related discipline including 12 hours in computer science. It is further strongly recommended that they submit scores for a GRE subject test; computer science is preferred, but a related field is acceptable.

A brochure giving more detailed information is available from the department's Academic Office.

Master of Science. The MS degree requires 8 units, of which at least 4 must be in computer science, and a thesis. Three or more units must be at the 400 level, of which at least 2 must be in computer science and 1 must be Computer Science 499 (thesis research). Full-time students may complete their MS degree in one year.

Master of Computer Science.* This program does not lead to the doctorate and is designed for two groups of students. The larger group comprises students who enter without an extensive computer science background, but who nevertheless intend to become heavily involved with computers in their professional careers. The second group is that of students with computer science degrees who are interested in the application of computers to other professional, industrial, or commercial activities. The MCS degree requires 9 units, of which at least 4½ must be in computer science. Three or more of the units must be at the 400 level, of which at least 2 must be computer science courses. Four courses must be chosen from selected lists and 1 unit must be a seminar or special topics course.

Master of Science in the Teaching of Computer Science. The MSTCS program is for prospective teachers of computer science at undergraduate colleges, junior colleges, voca-

*Approval of this program is expected by the start of the 1990-91 academic year. Until approval, the MCS program described in the 1988-90 *Graduate Programs* catalog remains in effect.

tional-technical colleges, and high schools. The MSTCS degree requires 4 units in computer science, 2 in education, and 2 in an area relevant to computer science education. There is also a teaching project requirement, which may be satisfied in various ways (e.g., service as a teaching assistant, past or present employment as a high school or college teacher, practice teaching, or preparation of material for computer-aided instruction).

Doctor of Philosophy. Students admitted to the PhD program must take the departmental qualifying examination by the end of their fourth semester (third semester, if admitted with an MS degree). This examination tests students' understanding of 300-level material that is relevant to their intended research areas. A student who fails the examination may take it only one more time. The degree requires 16 course work units (8 units if an MS degree has been completed), of which at least 6 must be in computer science, 8 units in thesis research, and a thesis. The preliminary examination is orally administered by a five-person doctoral committee at the onset of the student's research, and the same committee conducts the final examination when the thesis is complete.

DANCE

Head of the Department: Patricia K. Knowles
Correspondence and Information: Graduate Program, Department of Dance, University of Illinois at Urbana-Champaign, 4-501 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: B. Blossom, P.K. Knowles
Assistant Professors: M. Corey, R. Dicello

(The resident faculty is augmented by visiting professional artists who teach advanced studio courses. The equivalent of one full-time faculty position is reserved for the Artist-in-Residence Program.)

Admissions. Prerequisites for admission are (1) an undergraduate degree in dance comparable to that granted by the University of Illinois at Urbana-Champaign or equivalent experience (students who are deficient in undergraduate course work may be admitted but will be expected to make up any deficiencies) and (2) demonstrated advanced technical skill and choreographic ability (candidates must pass a qualifying audition to confirm advanced technical proficiency and to demonstrate facility in choreography).

Graduate Degree Program. The MFA Program in Dance is a practice-oriented terminal degree program for students in performance and choreography. Degree requirements are 15 units and a minimum two-year (4-semester) residence. Course work taken to complete undergraduate deficiencies may increase the residence requirements to 5 or 6 semesters. A culminating creative project (Dance 498, 2 units) must be approved and accepted by the graduate faculty. In the areas of technique, choreography, performance, production, independent research, theory, seminar, and the culminating project, 12 units are required. The remaining 3 units of electives may be taken in dance or in related areas of interest. The candidate's ability to pursue graduate study will be assessed regularly, and he or she will be advised accordingly.

Financial Aid. Three forms of financial aid are offered by the Department of Dance: resident and nonresident tuition scholarships; graduate teaching assistantships that include tuition waivers; and the Creative and Performing Arts Fellowship that includes a $4,000 stipend and a tuition waiver. This Graduate College fellowship is awarded to a graduate student who demonstrates outstanding choreographic and performance talent.

ECONOMICS

Head of the Department: Daniel Orr
Director of Graduate Studies: Nicholas Yannelis
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R. Arnould, J. Atack, W. Baer, F. Blau, J. Brueckner, M. Ferber, J. Giertz, R. Gillespie, F. Gottheil, E. Grinols, P. Hartman, J. Heins, W. Hendricks, L. Kahn, A. Khan, R. Koenker, J. Leuthold, W. McMahon, L. Neal, P. Newbold, D. Orr, S. Rashid, R. Resek, P. Schran, F. Schupp, P. Spiller, C. Sprenkle, K. Taira, P. Wells, T. Yancey
Associate Professors: L. Alston, L. Arvan, A. Bera, D. Coes, L. DeBrock, R. Husby, C. Kahn, C. Kolstad, T. Ulen, H. Williamson, N. Yannelis
Assistant Professors: B. Chakravorti, J. Conley, H. Esfahani, M. Feldman, S. Greenstein, C. Kuan, P. Sen, M. Spagat, H. VanEgteren, A. Villamil

Graduate Degree Programs. The Department of Economics offers graduate work leading to the Master of Science in Policy Economics and doctor of philosophy degrees. The candidate for an advanced degree may specialize in the following fields: microeconomic theory, environment and natural resources, history of economic thought, public finance, monetary theory, international economics, economic history, labor economics, growth and development, comparative economic systems, urban and regional economics, mathematical economics, econometrics, industrial organization, law and economics, transportation economics, and human resource economics.

Master of Science in Policy Economics. This is a specially designed, intensive, one-year program of study. It is intended for promising, young administrators in government and private institutions (in both Third World countries and advanced, industrial countries) who need additional training in the areas of economic analysis and quantitative techniques. Individuals with other backgrounds and interests may substitute appropriate advanced-level courses for the core courses listed below.

The program of study in policy economics consists of 10 units of graduate course work. A core of four courses (macroeconomics, microeconomics, statistics, and applied econometrics) is required of all students in the program. Beyond that core, students select one field of concentration from those listed above. An additional four graduate credit courses are to be completed. Two of these must be taken in economics and an additional two courses may be in economics or in other areas. Students may enter the program in the fall term.

This required course work is further enriched through (1) a short course in computers, which is later used in the statistics and econometrics courses; (2) opportunity to go on field trips to observe financial institutions, commodity exchanges, and the like; (3) scheduled lectures by outstanding internationally known economists (two Nobel Prize laureates in economics have presented special seminars); (4) discussion groups and tutoring for participants who are having difficulty; (5) program staff to help with visas, housing, and other problems.

Tuition and fees for this program are substantially higher than tuition and fees in other University programs. No financial aid is available for students in this program.

Doctor of Philosophy. The PhD program requires the completion of 24 units of study beyond the bachelor's degree. Specific requirements include 1 unit in economic history, 1 unit in history of economic thought, 2 units in statistics and econometrics (some or all can be met by demonstration of proficiency), and 8 doctoral thesis units. The candidate is also required to pass written preliminary examinations in economic theory and in three specialized fields, including at least two in economics (course work with appropriate grades may be substituted for one of the three field exams). The normal preparation for these preliminary examinations is 4 units of study in economics theory and 2 units of study in each of the specialized fields. In addition, the candidate is required to give an oral defense of the thesis proposal and pass an oral final examination covering the research. A student with an

appropriate background in economics and mathematics who devotes full time to graduate work can complete the PhD degree in three years beyond the bachelor's degree. An additional year or more is usually necessary, however, for those holding part-time assistantships.

In addition to the standard undergraduate preparation in economics, the student is expected to have had at least two semesters of calculus and one of linear algebra to be admitted to the PhD program. The results of the Graduate Record Examination should accompany applications for admission. The Graduate College admission requirements apply. In addition, international students must submit TOEFL results; if they wish to apply for full financial aid, the Test of Spoken English (TSE) is also recommended.

Master's Program in Economics. A master of arts degree and a master of science degree are available for students in the PhD program to enable them to earn a master's as they work toward the PhD degree. Students interested in a terminal master's degree are not admitted to the PhD program.

Financial Aid. Over the past seven years, the Department of Economics has been able to offer fellowships or half-time assistantships to all domestic students who meet the standards for entrance or continuation in the PhD program. A similar commitment to domestic students is anticipated for the coming year. Teaching assistantships are generally not given to international students during their first year unless they have scored at least 230 on the TSE. International students are eligible for partial financial aid regardless of TSE scores.

EDUCATION

(Including Administration, Higher, and Continuing Education; Curriculum and Instruction; Educational Policy Studies; Educational Psychology; Special Education; and Vocational and Technical Education)

Dean of the College of Education: P. David Pearson

Correspondence and Information: Fred S. Coombs, Associate Dean for Graduate Programs, College of Education, University of Illinois at Urbana-Champaign, 120 Education Building, 1310 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: C.A. Ames, R.E. Ames, J.D. Anderson, R.C. Anderson, S.R. Asher, P.G. Braunfeld, D. Durkin, R.H. Ennis, H.S. Farmer, W. Feinberg, L.R. Goulet, M.B. Griggs, L.W. Harmon, L.W. Heal, R.A. Henderson, J. Hill, K.T. Hill, S.O. Ikenberry, W.D. Johnson, L.J. Jordan, B.B. Kachru, C.J. Karier, L.G. Katz, H.C. Kazanas, G. Ladd, J.W. Loeb, H.S. Maclay, T. Manolakes, J.A. Mason, G. McConkie, W.W. McMahon, A. Ortony, P.D. Pearson, A. Peshkin, L.A. Phelps, F.A. Rodgers, B.V. Rosenshine, L.J. Rubin, F. Rusch, S.J. Savignon, P. Shoresman, R.A. Smith, R.J. Spiro, B. Spodek, R.L. Sprague, R.E. Stake, B.E. Swanson, M.M. Tatsuoka, K.J. Travers, P.C. Violas, J.L. Walker, T.L. Wentling, C.K. West, I. Westbury, J.S. Zaccaria

Associate Professors: T.H. Anderson, B. Armbruster, A. Baroody, L.F. Bouton, N. Burbules, F.S. Coombs, E.J. Copeland, C.A. Cziko, J.R. Dennis, D.L. Essex-Sorlie, J. Farmer, L.F. Fitzgerald, J.A. Fley, J.W. Halle, D.L. Harnisch, H.R. Kaczkowski, K.R. Koenke, J. Leach, J.A. Levine, M.V. Levine, A.L. Madsen, E.F. McClure, J.A. McCollum, T.L. McGreal, R.E. Nelson, J.C. Ory, R.C. Page, A.M. Renzaglia, S. Rosenholtz, J.B. Rounds, E.B. Russell, D. Scott-Jones, M.M. Shorish, E.R. Terwilliger, P.W. Thurston, S.E. Tozer, T. Tracey, W.T. Trent, J.G. Ward, J.L. Wardrop, C.M. Weller, K.G. Witz

Assistant Professors: T. Ackerman, K. Alston, J. Chadsey-Rusch, K.A. Copeland, L. DeStefano, J.L. Ellickson, J. Gaffney, G. Garcia, P. Glidden, V. Harris, S. Johnson, C.E. Kozoll, S.R. Levy, L. Meyer, E.W. Osborne, N. Prestine, P.S. Riegel, M.A. Siegel, E.R. Steinberg, D. Walsh, M.L. Waugh, R.F. Wilson, P. Zodhiates

Emeritus Professors: C. Allen, H.S. Broudy, C.B. Cox, T. Denny, J.A. Easley, E.L. Evertts, R.N. Evans, O. Gould, J.T. Hastings, P.E. Hemp, D.D. Henry, G.A. Hoke, L.G. Humphreys, J.M. Hunt, M.B. Karnes, H.H. Lerch, C.J. McIntyre, W. McLure, F. McMurray, L. Metcalf, W.J.

Moore, C.H. Patterson, M.J. Phillips, L.J. Phipps, P. Quigley, F.M. Raubinger, H. Shores, R.H. Simpson, J.M. Slater, R. Tomlinson, L.R. Tucker

Graduate Degree Programs. The College of Education offers graduate work leading to the Master of Education, the master of arts, the master of science, the advanced certificate, the Doctor of Education, and the doctor of philosophy degrees.

Graduate students in the College of Education may enroll in one of the six departments listed above. The following suggests the broad range of specialties available within the college: agricultural education; aesthetic education; bilingual multicultural education; business, office, and distributive education; comparative education; continuing and adult education; computer applications in education; counseling psychology; early childhood education; educational administration and supervision; educational psychology; elementary school subject specialties (mathematics, language arts, science, social sciences); statistics and measurement; higher education; history of education; educational policy analysis; home economics education; human development; industrial education; language development; learning and instruction; philosophy of education; quantitative and evaluative research methodologies; reading; secondary education (English, mathematics, science, social science); sociocultural perspectives; special education; (a) special learning and behavior problems, severe behavioral handicaps, early childhood education, vocational education for students with special needs, skills improvement and (b) program administration; and teacher education (elementary, secondary, vocational, special). Other areas of specialization within education may be developed by the student and adviser. More detailed descriptions of specializations offered within departments are available through departmental offices.

Certification. State certification as a teacher or administrator is required for advanced graduate study in some fields. The Council on Teacher Education functions as the all-University governance system for certification. Graduate students who wish to qualify for the council's recommendation for a teaching certificate must complete the appropriate undergraduate or graduate program or its equivalent. Individual exceptions must be sought via petition to the council. Students are invited to contact the coordinator of the Council on Teacher Education to ascertain the approval status of each program with the Illinois State Board of Education.

Master of Education.

Admission. Students may be considered for admission if they are (1) graduates of an institution awarding a baccalaureate or equivalent degree comparable to that of the University of Illinois at Urbana-Champaign; (2) adequately prepared for advanced study as demonstrated by previous experience, personal qualifications, and scholastic records; and (3) recommended by the proposed department of study. The Graduate College admission requirements apply. Some departments in the College of Education require additional test scores of applicants.

Program Description. Within each of the departments in the College of Education exists a rich variety of practice-centered programs adaptable to the interests of beginning graduate students. The Master of Education is a professional degree designed for those students who seek a practical understanding to prepare them for work in the educational professions.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration, where there is a 10-unit requirement. Students are required to take two courses in educational psychology and two courses in educational policy studies. In educational psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In educational policy studies, one ½-unit course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, 307, and 308). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required, and the program is completed by additional 300- or 400-level courses selected by the student in consultation

with the academic adviser. Individual departments in the college may require a student to take additional courses beyond these to complete the program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No thesis is required for the EdM degree.

Master of Arts and Master of Science. Admission requirements are the same as those for the Master of Education degree.

Program Description. An extensive offering of research-based programs may be found in the college. All the specialties listed earlier may be pursued from a research perspective. The AM and MS are research-oriented degrees designed for students who seek research careers in education-related fields.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration and counseling psychology, where there is a 10-unit requirement. Students are required to take two courses in educational psychology and two courses in educational policy studies. In educational psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In educational policy studies, one course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, and 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, 307, and 308). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required. Individual departments may require a student to take additional courses to complete a program. The credit–no credit option may not be used to meet the minimum 8-unit requirement for this degree. No more than 2 units of thesis credit count toward the minimum 8 units. Each student must defend the required thesis in an oral examination before a committee of three faculty members chaired by the student's adviser.

Advanced Certificate in Education.
Admission. A master's degree in an appropriate field and two years of successful professional education experience are required for admission to the advanced certificate program. Some advanced certificate programs require students to submit Miller Analogies Test scores for admission.

Program Description. The advanced certificate may be pursued in administration, higher, and continuing education; curriculum and instruction; educational psychology; special education; and vocational and technical education. The advanced certificate program is intended for students who desire a planned course of study beyond the master's degree, but do not wish to pursue the type of scholarly work typically expected in a doctoral program.

Requirements. A minimum of 8 units beyond the master's degree is required for the degree; 4 units must be at the 400 level. A student who has not previously taken the foundations courses in educational psychology and educational policy studies required for the EdM, AM, or MS degree must do so or pass proficiency examinations for these courses. The credit–no credit option may not be used to satisfy the minimum requirements for this degree.

Doctor of Education
Admission. Applicants for study leading to doctoral degrees must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Applicants should contact departments concerning requirements for submission of test scores and other information. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The general admission requirements of the Graduate College must be met.

Program Description. Students may study any of the broad range of specialties listed on page 84. Programs leading to the Doctor of Education degree are designed to provide advanced

professional training and to develop further ability in the scholarly study of professional practice-centered problems.

Requirements. The degree requires 16 units of credit, including up to 4 units of thesis credit, beyond the master's degree. A student who has completed course work taken as part of the requirements for the Advanced Certificate in Education at the University of Illinois at Urbana-Champaign may petition for the application of not more than 6 units of such work toward the program leading to the Doctor of Education, provided that the course work has been taken within five years of the date of petition. Within the required 16 units, a student must complete two perspective course options of 2 units each, designed to help in understanding and interpreting the developing practitioner-scholar role. Options are chosen from an approved list of courses in several areas. Between admission and completion of degree requirements, an EdD student must complete a supervised field work experience for which from 1 to 4 units of credit may be awarded.

Minimum residence requirements may be met by on-campus registration for either two consecutive semesters with at least 3 units of course work in each, or one semester with at least 3 units plus at least 1½ units in the summer session immediately preceding or following.

Near the end of course work and before admission to the preliminary oral, the applicant must take a minimum of ten hours of written examinations, eight in the special field of study and two in research methodology. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by three readers. All parts of the examination must display competent doctoral work to all readers.

An EdD candidate must complete a thesis in accordance with the general requirements of the Graduate College for which no more than 4 units of thesis credit may be used to meet the 16-unit requirement.

Doctor of Philosophy

Admission. The applicant must hold a master's degree with a major in education or another related subject from an institution awarding a degree comparable to the University of Illinois at Urbana-Champaign. The Graduate College admission requirements apply. Applicants must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or Graduate Record Examination, as well as other tests. Applicants should contact departments concerning requirements for submission of test scores and other information.

Program Description. Students may study any of the specialties listed on page 84. The PhD program is planned by each student with an adviser to develop the student's ability to do scholarly research in a specialized field of education.

Requirements. The PhD degree requires 16 units of credit beyond the master's degree, including up to 8 units of thesis credit. Each candidate must fulfill an educational research study early in that program under the guidance of a research committee. Each PhD candidate in the College of Education completes, as a part of the graduate program, an approved supervised professional work experience that consists of at least the equivalent of half-time work for one semester. This requirement is to be completed during the period between admission and completion of degree requirements. Acceptance of credit earned elsewhere does not reduce the Graduate College resident credit requirement. The College of Education requires a residence period beyond the master's, which must include two successive semesters on the Urbana-Champaign campus, in each of which the student takes a minimum of 3 units.

A student is required to demonstrate competence in one of several research methodology areas. This requirement is in addition to the minimum of 16 units of credit beyond the master's degree. Research methodology area requirements are available from the Instructional Programs Office, College of Education.

A PhD candidate must complete a minimum of eight hours of written examinations in an area of specialization. Examinations are taken in two parts of four hours each. Additional written or oral examinations may be required by some departments or areas of specialization.

Each portion of the examination is read and evaluated separately by at least three readers. All parts of the examination must display competent doctoral work to all readers.

A PhD candidate must complete a thesis in accordance with the general requirements of the Graduate College.

Financial Aid. All major doctoral programs have teaching and research assistantships available. Some fellowships and tuition and service fee waivers are also available. In the past it has been possible for a majority of doctoral students to receive some form of financial aid during their period of study. Additional information concerning financial aid can be obtained from the six departmental offices listed on page 83.

ELECTRICAL AND COMPUTER ENGINEERING

Head of the Department: T.N. Trick

Correspondence and Information: Graduate Programs, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 155 Everitt Laboratory, 1406 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: N. Ahuja, M.T. Basar, S. Bishop, J.J. Coleman, G. Cybenko, T.A. DeTemple, F. Dunn, J.G. Eden, O.L. Gaddy, C.S. Gardner, B. Hajek, I.N. Hajj, K. Hess, N. Holonyak, Jr., T.S. Huang, B.J. Hunsinger, R. Iyer, W.K. Jenkins, S.M. Kang, K. Kim, P. Kokotovic, P.R. Kumar, S.W. Lee, C.H. Liu, Y.T. Lo, P.E. Mayes, G.A. Metze, R. Mittra, D.C. Munson, Jr., W.D. O'Brien, Jr., M.A. Pai, J.H. Patel, W.R. Perkins, H.V. Poor, F.P. Preparata, M.B. Pursley, P.L. Ransom, N.N. Rao, D.V. Sarwate, P.W. Sauer, C.F. Sechrist, Jr., L.G. Smith, G.E. Stillman, T.N. Trick, J.R. Tucker, R.J. Turnbull, J.T. Verdeyen, B.W. Wah, K.C. Yeh.

Associate Professors: P. Banerjee, J.W. Beauchamp, D.J. Brown, K.Y. Cheng, W.C. Chew, S.L. Chuang, M. Farmward, S.J. Franke, L.A. Frizzell, W.K. Fuchs, P.W. Klock, E. Kudeki, M.J. Kushner, J.P. Leburton, H. Lee, M.C. Loui, J.W. Lyding, R.L. Magin, E.A. Mechtly, H. Merkelo, H. Morkoc, B. Oakley II, K.R. Poolla, B.C. Wheeler.

Assistant Professors: I. Adesida, K.S. Arun, A.R. Barron, Y. Bresler, C. Daft, K.C. Hsieh, W.M. Hwu, D.L. Jones, J. Kolodzey, P.T. Krein, S. Meyn, G. Papen, C. Polychronopoulos, V.B. Rao, U. Ravaioli, D.G. Saab, R. Saleh, J.E. Schutt-Aine, B.S. Song, P.C. Yew.

Graduate Degree Programs. The department offers graduate study and research in electrical and computer engineering leading to the degrees of master of science and doctor of philosophy. Courses and research opportunities are offered in four general areas: *computer engineering and computational science,* which includes computer architecture, VLSI design and CAD tools, hardware, software and applications, fault tolerance, testing, performance evaluation, computer vision, robotics, and algorithms and complexity; *fields and waves,* which includes electromagnetics, antennas, millimeter wave-integrated circuits, radar scattering, propagation, atmospheric and ionospheric studies, and remote sensing; *physical and quantum electronics,* which includes solid-state theory and devices, compound-semiconductor epitaxial growth techniques, microwave and high-speed devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles; and *systems,* which includes integrated circuits, computer-aided design, signal and image processing, communication systems, coding and information theory, communication networks, control systems, optimization, power and energy systems, and power electronics. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, biomedical instrumentation, ultrasonics, electronic music, radiation oncology, and nutritional sciences.

Admission. Applicants must have completed an electrical engineering curriculum or a computer engineering curriculum substantially equivalent to those of the University of Illinois at Urbana-Champaign. A minimum GPA of 4.0 (A = 5.0) on the last sixty hours is required. However, because of space limitations, applicants with GPAs below 4.5 are rarely admitted. All applicants must submit scores from the general test of the Graduate Record

Examination. Applicants with master's degrees are admitted only if a faculty member is willing to serve as the PhD thesis adviser. Accordingly, such applicants should write or call prospective PhD advisers and discuss their research interests and potential PhD thesis topics well in advance of application deadlines.

Graduates of curricula in the physical sciences, mathematics, and computer science may be admitted with limited standing if they are judged to have the necessary background to profit from graduate work in electrical and computer engineering. Such students are admitted to full standing after completing course work to remove deficiencies.

Master of Science. The MS degree requires 8 units of credit and a thesis. At least 4 units must be in 400-level courses in electrical and computer engineering. One course must be chosen in each of two areas from lists of specific courses in the four general areas. A master's thesis requiring a minimum of 1 unit of credit must be submitted by all candidates. Thesis credit is included in the required 8 units and may be applied to the 400-level course requirement. There is no final examination for the MS degree.

Doctor of Philosophy. Admission to PhD candidacy is based on the faculty's evaluation of the student's research potential, scholastic competence as evidenced by grades and class ranks, and satisfactory performance on the PhD qualifying examination. Students admitted with bachelor's degrees take this examination after completing 6 units of course work including at least three 400-level courses in electrical and computer engineering, while students admitted with master's degrees take the examination after completing 2 units of course work including at least one 400-level course in electrical and computer engineering. A minimum graduate GPA of 4.25 as well as a minimum GPA of 4.25 on 400-level course work is required in order to be considered for admission to PhD candidacy.

The minimum requirements for the degree of doctor of philosophy are 8 units of course credit beyond the master's degree (or the equivalent), successful completion of the preliminary examination, 8 units of thesis research, a satisfactory thesis, and satisfactory defense of the thesis in a final examination. No foreign language proficiency is required.

Joint Degree Programs. A joint degree program leading to the degrees of Master of Science in Electrical Engineering and Master of Business Administration is offered in cooperation with the Department of Business Administration. Separately, the two degrees require a total of 24 units of credit; the joint degree program reduces the required credit to 18 units through an exchange of credits between the departments. Applicants must meet the admissions standards for both departments and be accepted by both departments. The degrees are awarded simultaneously after the requirements for both degrees have been met.

The department participates in the Medical Scholars Program, which allows students to pursue simultaneously the degrees of Doctor of Philosophy in Electrical Engineering and Doctor of Medicine. A separate application to the College of Medicine is required. Applicants must be accepted by the College of Medicine and by the department in order to participate in this program. For information, write to the Coordinator, Medical Scholars Program, College of Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801.

Extramural Study. Off-campus students who wish to pursue graduate degree programs from UIUC must apply and be accepted for admission as degree candidates in the Graduate College. It is recommended that students apply for admission before or during the semester in which they take their first off-campus courses. Students who are admitted as degree candidates after having completed one or more extramural courses without being admitted to the Graduate College may petition the Graduate College to apply a maximum of three units of such course work toward the degree requirements. For further information, write to the Office of Continuing Engineering Education, 422 Engineering Hall, 1308 West Green Street, Urbana, IL 61801.

Financial Aid. Fellowships, research assistantships, and teaching assistantships (all of which include tuition and fee waivers) are available for the majority of students who are admitted. International applicants generally are not awarded teaching assistantships but are eligible for the other forms of financial aid.

ENGLISH

Head of the Department: Richard Wheeler
Director of Graduate Studies: James Hurt
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 210 English Building, 608 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: D. Baron, N. Baym, E. Brandabur, R. Carringer, H. Cole, J. Dussinger, J. Frayne, J. Friedman, P. Friedman, P. Garrett, A. Guibbory, G. Hendrick, J. Hurt, D. Kramer, L. Lieberman, C. Neely, C. Nelson, C. Sanders, R. Shuman, J. Stillinger, E. Watts, R. Wheeler
Associate Professors: G. Adelman, L. Chai, L. Danielson, J. Dundas, C. Fontenot, J. Hinely, F. Hodgins, A. Kaufman, M. Kaufmann, D. Kay, J. Klein, C. Kyle, D. Majdiak, H. Marder, B. Michelson, M. Mullin, R. Parker, M. Shapiro, B. Smalley, Z. Sullivan, L. Waldoff
Assistant Professors: A. Anderson, M. Berube, E. Bohls, D. Cruikshank, A. Deck, D. Jacobson, S. Muir, J. Stottlar, R. Sullivan, C. Wright

Graduate Degree Programs. The Department of English offers programs of study leading to the master of arts, the Master of Arts in the Teaching of English, and the doctor of philosophy degrees. The PhD program is, in general, designed to educate and train teacher-scholars who will take positions in colleges and universities throughout the country. The master of arts programs may be either a first step toward the PhD degree or a final educational stage for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. There is no graduate creative writing program.

Admission. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least 20 semester hours of undergraduate college work in English and American literature, excluding required college work in rhetoric or composition. Applicants are required to submit Graduate Record Examination scores for the verbal and advanced tests. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been significantly higher than the 4.0 (A = 5.0) required by the Graduate College. The committee on admissions tends to select those applicants who have a solid array of undergraduate courses, knowledge of a foreign language, and real promise of earning degrees within a reasonable time. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Arts. A candidate for the AM in English must spend at least two semesters or the equivalent in residence and complete at least 8 units of course work. At least 4 units must be at the 400 level, and 3 of the 4 must be in English. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work. The student must pass, on formal examination, the master's comprehensive examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's degree must apply formally and is considered in competition with applicants who are taking the master's degree elsewhere. Seldom are applicants accepted with graduate averages below 4.5. A student who has taken the master of arts degree elsewhere must pass the master's comprehensive examination during the first year of residence and give evidence of knowledge of one foreign language on a level equivalent to that required of AM candidates in our program. (The master's comprehensive examination can be waived by the director of graduate studies if the candidate submits appropriate evidence that a similar examination formed part of his or her master's degree.) The student takes 8 units of course work, planned in consultation with an adviser. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There is one formal examination, the special field examination, which is usually taken as the student completes course work and prepares to write the

thesis. The student then goes on to write a thesis under the direction of a committee composed of three professors. A total of 16 units beyond the master's degree, including thesis credits, are required. A full-time student can complete this program in three years beyond the master's degree.

Financial Aid. Financial aid is available to students in the form of fellowships, teaching assistantships, and waivers of tuition and service fees. Applicants are considered at only one time of the year, and the deadline for submitting applications is February 15. For complete information about the program, prospective applicants should write to the above address for the department's handbook on graduate studies in English.

ENGLISH AS AN INTERNATIONAL LANGUAGE

Director of the Division: Braj B. Kachru
Correspondence and Information: Director, Division of English as an International Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L. Bachman, C.C. Cheng, W. Dickerson, H. Hock, B. Kachru, Y. Kachru, C.-W. Kim, H. Maclay, S. Savignon, L. Zgusta
Associate Professors: E. Bokamba, L. Bouton, J.R. Cowan, G. Cziko
Assistant Professors: S. Gonzo, M. Mack, N. Markee
Emeritus Professor: K. Aston

Graduate Degree Program. The Division of English as an International Language offers a Master of Arts in the Teaching of English as a Second Language (MATESL).

Admission. In addition to meeting the Graduate College admission requirements, applicants should present evidence of appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher-training curriculum in one of the above. Native speakers of English must have studied at least one foreign language for four semesters or the equivalent, or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English by attaining a score of at least 570 on the TOEFL examination. The TOEFL examination is required of all applicants to the MATESL curriculum who are not native speakers of English, even when the requirement for that examination has been waived by the University itself.

Master of Arts in the Teaching of English as a Second Language. The program leading to this degree requires candidates to complete a minimum of 10 units of course work and either a written comprehensive examination or a thesis. Usually candidates can meet all degree requirements in two years.

The MA program offers two separate curricula or tracks. One track is designed for candidates whose principal interests are in language pedagogy and related research. The other track encourages candidates to concentrate more heavily on applied research in various aspects of English studies, such as those listed below under faculty specializations. A detailed description of the two MA tracks is available upon request.

The doctor of philosophy degree, an option in applied linguistics and the teaching of English as an international language, is available through the Department of Linguistics and the interdisciplinary program in Second Language Acquisition and Teacher Education (SLATE). Members of the graduate faculty of the Division of English as an International Language are available to serve on doctoral committees. Faculty specializations include neurolinguistics, sociolinguistics, psycholinguistics, language testing, contrastive discourse, lexicography of English, stylistics, language processing, reading, literacy, pragmatics, computers in second language acquisition and learning, methodology of language teaching, curriculum design, and English in the world context. Applicants interested in working toward a doctorate in linguistics should write to the Chairman, Department of Linguistics, 4088 Foreign Language

Building, 707 South Mathews Avenue, Urbana, IL 61801. Those interested in SLATE should write to the Chair, SLATE Program, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801.

Financial Aid. Financial assistance is not usually awarded during a MATESL candidate's first semester. Exceptions to this policy are sometimes made when an applicant has had extensive experience in teaching English as a second language or has an outstanding academic record. A limited number of University fellowships are available for exceptionally qualified candidates. Teaching assistants teach students in the division and in the Intensive English Program, which is a constituent unit of the division.

ENVIRONMENTAL STUDIES

Director of the Institute: Roger A. Minear
Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 408 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.J. Burdge, D.M. Gardner, L.G. Hansen, L.D. Hopkins, R.A. Larson, R.A. Minear, M.J. Plewa, G.L. Rolfe, W.D. Seitz
Associate Professors: C.D. Kolstad, B.M. Francis
Assistant Professors: J.M. Alho, E.H. Jeffery, K.N. Paige, S.L. Schantz, D.G. Simpson, H.J. van Egteren, J. Vining
Emeritus Professors: B.B. Ewing, R.L. Metcalf

The Institute for Environmental Studies coordinates and supports programs of research, teaching, and public service in areas related to environmental quality. Although the institute does not offer degree programs, it offers graduate-level courses on environmental subjects and provides opportunities for students working within specific disciplines to participate in interdisciplinary environmental research.

The institute's close ties with many other campus units make it possible for students seeking graduate degrees from those units to engage in environmental research within the institute's varied interdisciplinary program. Current scholarly research at the institute addresses a wide range of significant environmental program areas, including environmental toxicology, environmental mutagens and carcinogens, water quality and water resources management, effects of pollution on biological systems, environmental chemistry, social and economic impacts of resource development, methods of environmental risk assessment, analysis of environmental perception and decision making, economics of environmental regulation, and environmental quality management. This research program involves faculty with backgrounds in such diverse fields as genetics, chemistry, pharmacology, teratology, ecology, engineering, economics, leisure studies, psychology, sociology, and statistics.

The interdisciplinary environmental toxicology program, coordinated by the institute, offers specialized training in the study of toxic substances in the environment. This program has recently been expanded to provide a concentration in the health effects of environmental toxicology. Graduate students with backgrounds in fields such as the life sciences, health sciences, chemistry, or engineering, are eligible to apply for admission to the program. Faculty from several University schools and colleges participate in the program's teaching and research activities and serve as research advisers to its students. In addition to completing a core of course work in environmental toxicology, degree candidates must satisfy the requirements of the cooperating graduate unit in which they are enrolled. Financial support is available through a limited number of graduate research assistantships for which students may apply through the institute. A brochure describing the program and the requirements for admission and graduation is available from the institute.

The institute's interdisciplinary program in environmental mutagens and carcinogens complements the graduate degree specialization in environmental toxicology described above. The objectives of this program are to develop methods to detect and identify mutagenic substances; determine their sources, transport, transformations, and fate in the

environment; evaluate exposures to target organisms; and evaluate the economic and social impacts of these exposures.

Further information on opportunities for graduate education in environmental studies at the University of Illinois at Urbana-Champaign is provided in *Environmental Graduate Programs*, a brochure available from the institute. Also available is a comprehensive listing of environmentally oriented courses currently offered by the institute and by other campus units.

EXTENSION EDUCATION

Head and Graduate Adviser: Violet M. Malone

Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 330 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

Graduate Degree Program. The Master of Extension Education degree program is a professional program providing advanced study in agriculture and in human resources and family studies, including further study in the social sciences.

Admission. Applicants are expected to possess a bachelor's degree in agriculture, home economics, or a closely related field, and to meet the Graduate College admission requirements.

Degree Requirements. The program consists of a minimum of 8 units with a thesis or 9 units without a thesis. Three units must be in 400-level courses, with 2 of these in the major field. A major, consisting of 4 units, may be taken in agriculture, human resources and family studies, or the social sciences. Students majoring in agriculture or human resources and family studies select 4 additional units from the social sciences; those majoring in the social sciences select 4 additional units from agriculture or human resources and family studies. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. At least 4 units must be earned in residence on the Urbana-Champaign campus.

FINANCE

Chair of the Department: Charles M. Linke

Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820-6271

GRADUATE FACULTY

Professors. W.R. Bryan, I.O. Bull, T.E. Cammack, P.F. Colwell, J.E. Finnerty, J.A. Gentry, J. Lakonishok, C.M. Linke

Associate Professors: R.E. Cannaday, S.P. D'Arcy, M.J. Lynge, Jr., H.Y. Park, J.R. Ritter, D.T. Whitford

Assistant Professors: L.K. Chan, Y. Dokko, V.G. France

Graduate Degree Programs. The Department of Finance offers graduate work leading to the master of science and doctor of philosophy degrees. The following fields are available for specialization: financial institutions, corporation finance, investment, insurance, and urban economics and real estate.

Admission. The minimum required admission grade-point average is 4.0 (A = 5.0). To be admitted without deficiencies, the applicant should have completed an undergraduate course in computer science, financial accounting, managerial accounting, principles of economics, calculus (two semesters), probability and statistics (two semesters), and two courses in financial management. Courses to remove deficiencies may be taken after beginning the program, but such courses will not count toward the departmental requirements for gradua-

tion. Candidates are required to submit aptitude test scores from the Graduate Management Admission Test. The score will be used by the Graduate Standards Committee, along with other information, in evaluating the applicant's qualifications for graduate study.

Master of Science. A candidate for the master's degree in finance must spend at least two semesters in residence. The credit requirement for this degree is 8 to 10 units. Two units of economic theory are usually required. However, students with sufficient economic theory course work may have this requirement replaced by other economics course work, additional finance course work, or additional elective course work, as determined by the Graduate Standards Committee. The department has an optional thesis policy for the master's degree. The credit requirement for this option is 8 units. Three of the 8 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work. The credit requirement for the nonthesis option is 10 units; 3 of these 10 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work.

Master of Science in Finance and Master of Architecture. The Department of Finance and School of Architecture offer a joint master's program. Initially individual requirements are the same for each individual program. Program prerequisites are a baccalaureate degree in architecture, including Computer Science 102 and Mathematics 120 to 131; background courses in finance met by graduate course requirements; 2 units of economic theory; 3 units of quantitative methods; 4 units in finance; 4¾ units of architectural options courses; 3 units of the financial management sequence in business management; and other elective requirements. The joint master's program is granted when these requirements, totalling 21¾ units, are completed.

Doctor of Philosophy. The first stage toward the degree of doctor of philosophy ends when the candidate receives a master's degree or earns the equivalent credit; the second stage comprises 8 units of work, fulfillment of departmental requirements, and successful preliminary examinations; the third stage includes research and seminars (8 units), preparation of the dissertation, and the final examination. A student's courses and research are planned with his or her adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the department. The student should become familiar with these requirements and satisfy them as soon as possible.

A candidate for the doctorate who has received a master's degree from a recognized institution receives the equivalent of 8 units of credit for that work. If such credit is to be used in partial fulfillment of the requirements for the doctorate, the candidate is examined on the content of the courses involved at the time of the preliminary examinations.

To enter the third stage of a doctoral program, a candidate must pass preliminary examinations to test his or her qualifications for further advanced study and research. The examinations are written and oral. For preliminary examination, candidates are responsible for four fields: economic theory, two finance areas, and one elective area.

The doctor of philosophy is primarily a research degree, and the candidate must demonstrate the capacity for independent research by producing an original thesis on a topic within his or her major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The candidate is admitted to the final examination by the dean of the Graduate College upon completion of the dissertation and the recommendation of the department.

FOOD SCIENCE

Head of the Department: Bruce M. Chassy

Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 103 Agricultural Bioprocessing Laboratory, 1302 West Pennsylvania Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Bechtel, B.M. Chassy, M. Cheryan, J.W. Erdman, P.V. Johnston, A.I. Nelson, R. Nelson, T. Nishida, E.G. Perkins, A.J. Siedler, M.P. Steinberg, W.J. Visek, L.S. Wei, L.D. Witter
Associate Professors: C. Argoudelis, I. Baianu, H.P. Blaschek, B.H. Cho, S.E. Martin, R. Villota
Assistant Professors: W. Artz, L. Dunn, J. McCord

Graduate Degree Programs. The Department of Food Science offers graduate work leading to the master of science and doctor of philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: processing-engineering, chemistry, microbiology, and nutrition.

Admission. In addition to meeting the Graduate College admission requirements, a student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies may be removed with graduate credit courses designed for this purpose.

Master of Science. To obtain a master's degree, a student must have 2¾ units in food science. The remainder of the 8 units of credit required consists of graduate courses selected from inside or outside the department that are appropriate for the training and development of the student in the field of specialization. At least 3 units must be at the 400 level (¼ unit of this is seminar). A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required. Students whose native language is not English are required to have competence in English by passing English as a Second Language 111.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the doctor of philosophy degree must have additional credit in seminar (¼ unit) and thesis research (8 units). The remainder of the 16 units required for the degree consists of graduate courses selected from inside or outside the department that are appropriate for training in the student's field of specialization. The student must demonstrate proficiency in one foreign language or complete a special option approved by the department, which is not counted as part of the 16 required units of credit. Students whose native language is not English must pass English as a Second Language 401. Upon completion of all necessary formal courses and special options, the student is required to take an oral preliminary examination. After passage of the preliminary examination, the student's activities are primarily devoted to thesis research. Upon submission of the thesis, the candidate is admitted to the final oral examination before a graduate faculty committee. The PhD degree in food science may be combined with the study of medicine in the University of Illinois at Urbana-Champaign Medical Scholars Program.

FORESTRY

Head of the Department: G.L. Rolfe
Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 110 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Chow, J.O. Dawson, G.L. Rolfe, R.M. Skirvin
Associate Professors: S. Brown, J.M. Cheeseman, G.Z. Gertner
Assistant Professors: M.B. David, D.E. Harry, L.R. Iverson, T.D. Marty, G.A. Mendoza, A.D. Pugel

Graduate Degree Program. The Department of Forestry offers graduate work leading to the master of science degree. The doctor of philosophy degree is not offered by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint

appointment in another department or is on the staff of an interdisciplinary doctoral program. Such areas of study include ecology, economics, genetics, physiological and molecular plant biology, soils, and wood science.

Admission. The prerequisite for graduate study in the Department of Forestry is a bachelor's degree in forestry or a related field. A grade-point average of 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Those applicants who do not meet the minimum requirements are encouraged to take the Graduate Record Examination, as exceptions to these prerequisites are possible on an individual basis. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. To qualify for the master of science degree, a student must earn at least 8 units of graduate credit, with at least 3 units in courses at the 400 level. At least half of the 8 units must be from courses meeting on the Urbana-Champaign campus or from courses approved by the Graduate College for residence credit, although meet at other locations. Depending on their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student in such areas as biometrics, ecology, economics, genetics, management, physiology, policy, soils, statistics, and wood science.

In most cases, a thesis is required, but it may be waived if such waiver will result in a more appropriate program for the individual student. The forestry seminar is required of all graduate students. There are no language or qualifying examination requirements.

Financial Aid. Besides University and other fellowships for which graduate students may compete, the Department of Forestry offers the Spaeth-Boggess Fellowship and a number of graduate research assistantships ranging from 25- to 67-percent time. Graduate assistants are exempt from tuition and the service fee, but not from the health service and insurance fees.

Research Interests. Major areas of faculty research include agro forestry; atmospheric deposition effects on forest soils; ecology of forested bottomlands; economics and management of Illinois forests in particular and national forests in general; economics of multiple use; forest/soil relationships; forest tree improvement; management of forest vegetation in stressed urban settings; modeling of forest growth, inventory, and analysis; oak regeneration; population and molecular genetics of forest trees; properties of wood composite materials; remote sensing and geographic information system analysis of forested landscapes; resource education; symbiotic nitrogen fixation by trees and shrubs; tropical forest ecology; utilization of low-grade hardwood species and plant residues; water quality and watershed management; and wood mechanics.

FRENCH

Head of the Department: Paul Gaeng
Director of Graduate Studies: Emile Talbot
Correspondence and Information: Department of French, 2090 Foreign Languages Building, University of Illinois at Urbana-Champaign, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Accad, H. De Ley, P. Gaeng, J. Jahiel, A.K. Mortimer, R.J. Nelson, S. Savignon, E. Talbot
Associate Professors: S. Gray, A. Hadley, F. Jenkins
Assistant Professors: K. Fresco, D. Kibbee, D. Lepetit, J.P. Mathy, M. Rosello, S. Shinall

Graduate Degree Programs. The Department of French offers graduate courses leading to the master of arts and the doctor of philosophy. Candidates for the AM degree may specialize in literature, in expanded French studies, or in French linguistics or in the learning/teaching

of French. Candidates for the PhD degree may choose one of four specializations: literature, expanded French studies, French linguistics, or second-language learning and teaching.

Admission: Students are usually considered for admission to the AM program who have an overall undergraduate admission average of 4.0 (A = 5.0) with an average in French of 4.5. Students should usually have had a college major in French. Entering students are given a diagnostic test to determine whether remedial study in French language courses is necessary. Some knowledge of other Romance languages and literatures is desirable. Students seeking admission to the PhD program with a master of arts degree earned elsewhere are expected to have a 4.5 grade-point average in graduate courses. The master's degree should be in French literature or in French studies. Candidates seeking admission to the PhD concentration in second-language learning and teaching may hold an MAT degree.

Master of Arts. Candidates in all master's programs must complete 8 units of course work and pass an AM examination. Candidates in literature must take an AM examination based on a reading list covering the field of French literature. The examination in expanded French studies covers, in addition to readings in the field of French literature, material bearing on the candidate's field of specialization in French culture or related disciplines. The examination in linguistics is based on a list of readings in linguistics and in literature. The examination in French learning/teaching includes readings in second-language acquisition and teaching methods in addition to selected readings in French literature and/or civilization. Candidates in all programs are required to demonstrate, at the time of the master's examination, an ability to communicate effectively in both written and oral French.

Doctor of Philosophy. Candidates in all programs must complete 16 units beyond the master's degree, including a minimum of 8 units of course work beyond the AM degree, and must pass a preliminary examination and write an acceptable thesis. Although teaching is not a general Graduate College requirement, the Department of French requires PhD candidates to do some teaching as part of their academic work, as such experience is considered a vital part of the graduate program.

PhD in Literature. This program is designed to prepare literary scholars and teachers. Candidates are required to include courses in research methods and textual criticism, linguistics or linguistically oriented textual theory, old French, and French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

PhD in Expanded French Studies. The doctoral program in expanded French studies allows for research in francophone literature or in the relation of French literature to some nonliterary discipline. Two of the required 8 units of course work beyond the AM degree may be taken in other departments or programs when available and approved by the graduate adviser. Candidates are required to include courses in French literature. Reading proficiency in one language other than French or English and one year of college Latin or the equivalent are required; or students may demonstrate high proficiency in one foreign language.

PhD in French Linguistics. This is a graduate curriculum that offers training in French historical and descriptive linguistics and philology. Students in this program are required to take 3 units in French literature and may elect up to 2 units of related work in other departments, in addition to a required course in the structure of French and either the history of French or a course in Old French. At the doctoral level, a concentration in Romance linguistics is available in cooperation with the Department of Spanish, Italian, and Portuguese; the Department of Linguistics; and the Department of the Classics.

PhD in Second-Language Learning/Teaching. An interdisciplinary concentration in second-language learning/teaching is available to candidates with an AM or MAT degree in French and at least one year of experience in teaching French as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology, in addition to advanced study in French language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Financial Aid. Assistantships and University fellowships are awarded. Several graduate students each year spend the school year in France under a graduate exchange agreement with the French government. The department has also initiated exchange programs with the University of Metz and the University of Dijon, France, and the University of Liege, Belgium.

GENERAL ENGINEERING

Head of the Department: T.F. Conry

Correspondence and Information: Graduate Programs, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: T.F. Conry, W.J. Davis, E.N. Kuznetsov, J.V. Medanic, L.D. Metz

Associate Professors: O. Coskunoglu, W.B. Hall, M.H. Moeinzadeh, M.H. Pleck, H.L.M. dos Reis, M.W. Spong, T.R. Woodley, L. Wozniak

Assistant Professors: S.A. Burns, J.V. Carnahan, M.G. Strauss, S.D. Thompson, D.L. Thurston

Graduate Degree Program. The Department of General Engineering offers graduate study leading to the degree of master of science. The program consists of a core of required courses including a design thesis or project with supplementary courses selected by the student together with his or her adviser.

The program offers an approach to systems engineering and engineering design that crosses disciplinary lines. Graduates of the program are prepared to enter professional engineering positions in industry, government, and private practice. Graduate study and research can be pursued in the following fields: computational design, optimization, design systems, manufacturing systems, nondestructive testing and evaluation, robotics and control, system dynamics and simulation, operations research/management science, and biomechanics.

Admission. Applicants who have completed degree requirements in an accredited engineering program or its equivalent are eligible to apply for admission. Qualifications for admission include a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work. The Graduate Record Examination is not required but is highly recommended. For students whose native language is not English, the department requires a minimum TOEFL score of 600.

Master of Science. The minimum requirement for the degree is 8 units of credit with a thesis or 9 units without a thesis. Each candidate must successfully complete a minimum of 2 units of project design for the nonthesis degree or one unit of thesis research for the thesis degree. Each candidate must also successfully complete at least 7 additional units of graduate course work, of which at least 3 units must be at the 400 level.

It is possible to pursue the MS in General Engineering and the MBA degree simultaneously. The total time required is less than that needed to obtain both degrees independently. A total of 18 units of credit is required, including 4 units of work consistent with normal MSGE requirements, 12 units of MBA core courses and 2 units of project design, General Engineering 497. Separate admission to both departments is required, although only one application is necessary.

There also exists an extramural MSGE program, which is available to off-campus students in videotape and telecommunications formats.

Financial Aid. Qualified students may apply for financial aid in the form of teaching and research assistantships and waivers of tuition and service fees.

GEOGRAPHY

Head of the Department: G.J.D. Hewings
Correspondence and Information: Graduate Adviser, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.D. Fellmann, A. Getis, B.M. Hannon, G.J.D. Hewings, J.A. Jakle, D.L. Johnson, J.V. O'Loughlin, J. Thompson
Associate Professors: T.D. Frank, J.O. Huff, C.E. Thorn
Assistant Professors: T.J. Bassett, A.P. Elhance, S.A. Isard, B.L. Rhoads

Graduate Degree Programs. The Department of Geography offers work leading to the master of arts, master of science, and doctor of philosophy degrees. The department's specializations are organized into four programs: (1) *economic geography/regional science* (industrial location, transportation, techniques of urban and regional analysis, urban systems); (2) *historical and cultural geography* (historic landscapes, urban morphology, cultural ecology of economic development, technology and environmental change); (3) *physical geography* (fluvial, periglacial, soil, Quaternary Studies, remote sensing, geographic information systems); and (4) *urban and rural settlement and development* (development theory, international conflicts, migration, urban systems). Detailed descriptions of these programs may be obtained from the department office.

Admission. Students applying for admission to the master's program are expected to have a strong undergraduate background in geography and/or related disciplines. In addition to other Graduate College admission requirements, a grade-point average of at least 4.0 (A = 5.0) in the undergraduate major is required. PhD candidates are generally expected to have at least a 4.5 average in previous graduate work.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the master of science; others receive the master of arts. The Graduate College requirements for the master's degree apply.

Doctor of Philosophy. Admission presupposes distinction in completing the master's program in geography at the University of Illinois at Urbana-Champaign or its equivalent. In the doctoral program, the student develops depth in the program chosen for specialization and further advances in research competence. Of the 16 units required beyond the master's degree, 4 units of study in allied disciplines and a minimum of 6 additional units in geography are required. A student must complete the course requirements as determined by an individually planned program, initiate and complete research projects, and qualify for candidacy by passing the preliminary examination. Although there is no departmental foreign language requirement, students may offer a foreign language as a research technique.

Financial Aid. Fellowhips, teaching and research assistantships, and waivers of tuition and some fees are available in the department. See the discussion on financial aid in the Requirements and Procedures section for a description of the provisions of these awards.

Departmental Facilities. The department houses several laboratories: (1) the Spatial Data Analysis Laboratory is a facility for analysis of spatial patterns derived from maps, aerial photographs, and satellite images using computer cartography/image processing workstations; (2) the Cartography Laboratory has darkroom and drafting facilities; (3) the Soil Laboratory includes an X-ray diffractometer and a vacuum spectrometer; (4) the Geographic Information Systems (GIS) Laboratory is equipped with several networked SUN 360 machines and a wide array of software.

Map and Geography Library. Contained within the University's outstanding library is the Map and Geography Library which has an excellent collection of geography monographs, periodicals, and more than 500,000 maps and aerial photographs.

GEOLOGY

Head of the Department: R. James Kirkpatrick

Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois at Urbana-Champaign, 245 Natural History Building, 1301 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.E. Anderson, T.F. Anderson, D.B. Blake, R.L. Hay, W.H. Johnson, R.J. Kirkpatrick, G. deV. Klein, R.L. Langenheim, C.J. Mann, A.S. Nieto, P.A. Sandberg

Associate Professors: J.D. Bass, C.M. Bethke, W.P. Chen, A.T. Hsui, S. Marshak

Assistant Professors: S.P. Altaner, C.Y. Chen, J.W. Massmann

Graduate Degree Programs. The Department of Geology offers programs leading to the Master of Science in Geology, the Doctor of Philosophy in Geology, and the Master of Science in the Teaching of Earth Science. Students have a wide variety of choices in their courses and their research programs. Departmental research programs include many aspects of geology, geochemistry, and geophysics.

Admission. The admission requirements of the Graduate College apply. In addition, scores for the aptitude test of the Graduate Record Examination are required for admission to graduate work in geology as well as completion of at least one year of study in college-level calculus, chemistry, and physics. For more information, write to the educational coordinator.

Master of Science. The MS degree requires completion of at least 8 units of graduate credit and an MS thesis. Credit includes 6 units of formal course work and no more than 2 units of MS thesis research. In all cases, at least 3 units of formal course credit must be taken within the geology department and at least 3 units of formal course work must be completed at the 400 level. In exceptional circumstances, a student may petition to obtain the MS degree without completing an MS thesis. Such a student must complete 8 units of formal course work and one unit of independent study requiring a written report. A master's student must maintain a minimum grade-point average (GPA) of 4.0 (A = 5.0). If a student's GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter. Prior to finishing the degree, each student must present a colloquium on the thesis research. The MS degree is usually completed in about two years.

Master of Science in the Teaching of Earth Science. Candidates must earn 8 units of graduate credit, including 4 units in geology, 2 units in other earth science areas, and 2 units in education. At least 3 units of formal course work must be at the 400 level. In addition, candidates must fulfill the requirements to be certified to teach at the secondary school level in Illinois. A student must maintain a minimum GPA of 4.0 (A = 5.0). If a student's GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter.

Doctor of Philosophy. The PhD degree requires at least 24 units of graduate credit and completion of a PhD thesis. At least 10 of these units must be formal course work, with the remainder as independent study and thesis research. A minimum of 8 units must be PhD thesis research. At least half of the formal course work must be at the 400 level, at least 3 courses must be taken in the geology department, and at least 2 courses (totaling at least 1½ units) must be taken outside the geology department. Credit for MS thesis research is limited to a maximum of 2 units. Incoming students with an MS degree are usually allowed 8 units of credit towards the PhD (6 units of formal courses and 2 units of MS thesis research). There is no foreign language requirement. A student must maintain a minimum GPA of 4.0 (A = 5.0). If a student's GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter. PhD students are evaluated by three oral examinations: a qualifying exam, a preliminary exam, and a final

exam. The qualifying exam tests the breadth of knowledge as well as the ability to define and defend a research proposal in a specialized field at an early stage of graduate study. The preliminary exam tests advanced knowledge in a specialized field and the ability to define and defend a PhD dissertation proposal. The final exam tests the ability to complete and defend PhD dissertation research.

Financial Aid. Candidates for graduate degrees are usually supported through fellowships, research assistantships, teaching assistantships, waivers of tuition and service fees, and work-study programs. Fellowships and assistantships include tuition and fee waivers. Awards for financial assistance are based principally on a candidate's academic record, statement of plans, and letters of reference. Some part-time assistants are employed by the State Geological Survey located on campus.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: James M. McGlathery
Correspondence and Information: Head, Department of Germanic Languages and Literatures, University of Illinois at Urbana-Champaign, 3072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, U.H. Gerlach, H.G. Haile, W. Hollerer, M. Kalinke, H. Knust, R. Lorbe, J.W. Marchand, J.M. McGlathery, K.-H. Schoeps
Associate Professors: J. Lalande, R. Wright
Assistant Professor: M. Wade

Graduate Degree Programs. The Department of Germanic Languages and Literatures offers graduate programs leading to the degrees of master of arts, Master of Arts in the Teaching of German, and doctor of philosophy.

Master of Arts. Applicants should have completed undergraduate studies similar to the concentration in German at the University of Illinois at Urbana-Champaign, have a grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate course work plus any graduate work completed, and be able to follow lectures in the German language. Acquaintance with German history and culture in their relation to the general European background is desirable. Admission to the program is on a competitive basis.

Candidates for the Master of Arts in Germanic Languages and Literatures may emphasize either German or Scandinavian literature or linguistics. All candidates must take course work in both literature and linguistics.

The master's degree requires 8 units of graduate work, although deficiencies in undergraduate preparation may necessitate more than 8 units to meet the requirements. Residence and other requirements of the Graduate College must be met. Candidates for the AM degree must demonstrate proficiency in reading one language other than English and German (usually French). Required courses (or approved equivalents) are: German 365 and 366 (Structure of the German Language I, II), German 311 and 312 (German Literature 750-1770), German 415 (Middle High German) or Scandinavian 405 (Old Norse-Icelandic), German 420 (History of the German Language), German 410 (Introduction to Graduate Study), and two graduate literature courses at the 400 level. Electives may be chosen from within or from outside the department with the approval of the graduate adviser. The degree is awarded upon the successful completion of a three-hour written and a one-hour oral comprehensive examination, or upon successful defense of a thesis. More detailed information may be obtained from the departmental office.

Master of Arts in the Teaching of German. Applicants must meet the same admission standards as those for the Master of Arts in German. Candidates for the MAT degree must earn 5 units in German emphasizing either language and linguistics or literature and culture, 2 units in approved courses in educational policy studies, 1 unit of studies in educational foundations, and 2 courses in foreign language education. Candidates must also complete

all undergraduate requirements for a teaching certificate, although no graduate credit is given for undergraduate courses. In some cases, with proper advance approval, graduate courses may be applied to the teaching certification requirements. Residence requirements are those of the Graduate College. The degree is awarded after the successful completion of a three-hour written and a one-hour oral examination. More detailed information is available from the departmental office.

Doctor of Philosophy. Applicants must meet the admission standards outlined for the master of arts and, in addition, hold a Master of Arts in German (or equivalent) with a graduate grade-point average of 4.5 (A = 5.0). Admission to the program is on a competitive basis.

Candidates for the PhD in German may specialize in older German literature, modern German literature, Germanic linguistics, German and Scandinavian literature, or German language pedagogy.

Students working toward the PhD degree must have completed all requirements for the AM degree given above and complete an additional 8 units of course work approved by the graduate adviser. Residence requirements are those of the Graduate College. Candidates must demonstrate proficiency in reading two languages other than English and German that are considered useful in their area of specialization.

After passing the written preliminary examinations (three three-hour comprehensive examinations), the student is admitted to the oral examination, the successful completion of which admits the student to candidacy for the PhD degree. The candidate must then complete 8 units of thesis research and successfully defend the thesis in an oral examination. All candidates for the PhD degree must have taught the equivalent of three one-semester courses on the college level (i.e., teaching one-half time for one academic year) before being admitted to the final oral examination (thesis defense). An additional option in Second Language Acquisition in Teacher Education (SLATE) is available to candidates with an AM degree (or equivalent) in German and at least one year of experience in teaching German as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology in addition to advanced study in German language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics. More detailed information is available from the departmental office.

Financial Aid. Teaching assistantships are awarded on a competitive basis to promising candidates with strong academic records. Preference may be given to students who have lived in a German-speaking country or have had some teaching experience. Teaching assistantships are usually awarded at one-half time for the academic year. Each year the department may nominate one or two outstanding students for a University fellowship. A limited number of tuition and service fee waivers may also be available. Full details on amounts of financial aid and time limitations for eligibility may be obtained from the department office.

For continuing graduate students, the awarding of financial aid of all types is contingent upon the maintenance of satisfactory progress toward a degree.

Research Interests. The department faculty includes nationally and internationally recognized scholars in all areas of research within the field. These areas include older and modern German literature, medieval studies, Scandinavian literature, German film, computerized instruction, historical and synchronic Germanic linguistics, and German language pedagogy. The University Library has one of the nation's outstanding collections of works pertaining to study and research in German and other literatures of all periods and in Germanic and general linguistics.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: Robert F. Rich
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.F. Giertz, S.K. Gove, P.F. Nardulli, R.F. Rich

The Institute of Government and Public Affairs conducts policy-oriented research and public service. Primary emphasis is on research into public policy issues at the state and local levels, especially as these relate to Illinois. Public service activities arise from and contribute to institute research through contact with public officials and the identification of research problems. Each year the institute has several affiliate faculty members from related UIUC departments, as well as from other universities. The institute offers no courses, but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research are published in internal and external journals and books.

HEALTH AND SAFETY STUDIES

Head of the Department: R. Warwick Armstrong
Correspondence and Information: Director of Graduate Studies, Department of Health and Safety Studies, University of Illinois at Urbana-Champaign, 114 Huff Hall, 1206 South Fourth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.W. Armstrong, W.H. Creswell, Jr., P.B. Imrey, R.G. Mortimer, L.B. O'Reilly, T.W. O'Rourke, D.B. Stone
Associate Professors: A.M. Flood, L. Rubinson
Assistant Professors: R.L. Goldsteen, S.B. Montgomery, J.S. Reis, N.S. Van Winkle

Graduate Degree Programs. The Department of Health and Safety Studies offers programs of study leading to the master of science, Master of Science in Public Health, and doctor of philosophy degrees. At the master's degree level, the program offers options in epidemiology, health behavior, school health, health policy and administration, and community health education. The MSPH degree in community health education has been accredited by the Council on Education for Public Health. The PhD program is designed to prepare graduates for positions of leadership in teaching, research, and service in universities, industries, and private and government agencies in the United States and in other countries. Opportunities are available for graduate students who desire to concentrate in other public health areas through an intercampus program with the School of Public Health at the University of Illinois at Chicago.

Admission. The Graduate College admission requirements apply for all applicants. Candidates wishing admission to the MS program will have their grade-point averages computed for their last 60 semester hours of undergraduate courses (excluding student teaching, field work, or activity courses). In addition, satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination are required.

The admission requirements for the PhD program include the following: an acceptable grade-point average in the last 60 hours of undergraduate course work (not including student teaching, field work, or activity courses), an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test, and satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination. Candidates are required to have a personal interview with the director of graduate studies or other representatives of the department. Preference is given to students who have had at least two years of professional experience. Applicants whose native language is not English must score at least 590 on the TOEFL examination.

Master of Science. The specializations in epidemiology, health behavior, and school health require a minimum of 8 units of graduate credit. Three units must be at the 400 level with two of these units in health and safety studies courses. The program includes completion of three units of core courses, which are intended to provide overall knowledge of the public health field and the tools necessary for successful functioning as a health specialist. A thesis (1 to 2 units) is required. Students entering the program will be expected to have completed undergraduate course work in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the master of science degree.

The specialization in health policy and administration generally takes two years depending upon prior education and experience. A minimum of 12 units of graduate credit is required; 6 units must be at the 400 level with three of these units in health and safety studies courses. The program includes 8½ units of required courses, which are intended to provide an overall knowledge of the public health field and the tools necessary for successful functioning as a health policy and administration specialist; and a thesis or research project (½-1 unit). Students entering the program will be expected to have completed undergraduate course work in economics, social sciences, and data collection and processing, which includes issues of measurement, questionnaire design, computerization, descriptive health measure, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the degree.

Master of Science in Public Health. The program for the MSPH degree, which is in community health education, is accredited by the Council on Education for Public Health. The program generally takes two years depending upon prior education and experience. A minimum of 12 units of graduate credit is required. Three units must be at the 400 level with two of these units in health and safety studies courses. The program includes 6½ units of required courses that are intended to provide an overall knowledge of the public health field and the tools necessary for successful functioning as a community health education specialist; 2 units of field work experience in the summer; and a thesis (1 to 2 units). Students entering the program will be expected to have completed undergraduate course work in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the degree.

Doctor of Philosophy. A master's degree with a thesis or equivalent is required for applicants to the PhD program. Graduate course experience in public health, safety, ecology, epidemiology, and statistics with grades of B or better is expected prior to admission. Before admission to the PhD program, students may be required to take up to 3 units of additional course work to remedy deficiencies. Candidates for the degree must complete a minimum of 16 units of credit beyond the master's degree, including the following: two health and safety studies 400-level courses in the area of specialization; one health and safety studies 490 research seminar; one 400-level course in advanced quantitative methods; one minor for a minimum of 4 units, or two minors for a minimum of 2 units each (in both cases outside the major field); and completion of an acceptable dissertation (8 units). In addition, candidates must demonstrate the ability to speak and read two foreign languages, must complete 4 units of research skill courses, or must demonstrate the ability to speak and read one foreign language and complete 2 units of research skill courses. The candidate is required to pass written preliminary examinations covering health and safety, application of social science, epidemiology and ecology, research and quantitative methods, the major area of specialization, and the minor field; to pass an oral preliminary examination on the area of specialization and dissertation proposal; and to pass an oral defense of dissertation research.

Financial Aid. Financial aid is available on a competitive basis to qualified students in the form of teaching and research assistantships and tuition and service fee waivers.

Faculty Research Interests. Faculty research interests cover a wide range including, but not limited to, health education, school health, community health development, health behavior, health policy, health planning and management, life-span development, elderly care, human factors, safety and accident prevention, epidemiology, biostatistical and epidemiologic research methodology, and evaluation research.

Medical Scholars Program. This program allows the student interested in medicine and health and safety to earn both the M.D. and PhD (health and safety studies) degrees while gaining multidisciplinary research experience. Individually tailored programs can be developed within the requirements of both programs. Degree work will be arranged to accommodate the schedules of both programs. However, the course of study in health and safety will be equivalent to that of all other doctoral candidates. Contact the Program Director of the Medical Scholars Program, College of Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801, for further information regarding the program.

HISTORY

Chair of the Department: N. Geoffrey Parker
Director of Graduate Studies: Charles C. Stewart
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.L. Arnstein, R.M. Berdahl, P.P. Bernard, R.W. Burkhardt, Jr., O.V. Burton, D.E. Crummey, L.E. Eastman, P.B. Ebrey, W.D. Farnham, K.A. Hitchins, F.C. Jaher, R.C. Jennings, R.W. Johannsen, R.A. Jones, B.B. Kling, D.P. Koenker, J.L. Love, R.M. McColley, J.P. McKay, N.G. Parker, D.E. Queller, P.W. Schroeder, W.U. Solberg, C.C. Spence, M.L. Spence, C.C. Stewart, R.P. Toby, W.C. Widenor
Associate Professors: J.R. Barrett, J. Buckler, J. Haboush, C.M. Hibbard, D. Littlefield, J.A. Lynn, E.M. Melhado, R.E. Mitchell, D. Prochaska, J.H. Pruett, B. Uroff, J.E.K. Walker
Assistant Professors: W. Chow, P. Fritzsche, J. Hanes, N. Jacobsen, M.H. Leff, M. McLaughlin, S. Michel, A. Verner

Graduate Degree Programs. The Department of History offers graduate courses leading to the master of arts and the doctor of philosophy, complete details of which may be found in the department's brochure on graduate study in history. The master of arts degree may be either the first stage in preparation for the degree of doctor of philosophy or a terminal degree. A special program for teacher training is available, the Master of Arts in the Teaching of Social Studies (see page 146).

Approved areas of specialization are: ancient Greece; ancient Rome; Middle Ages; Renaissance and Reformation; Europe and dependencies, 1648-1815; Europe and dependencies since 1789; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; Colonial North America and Early United States to 1830; United States since 1815; Latin America; history of science; international relations since 1871; military history; Afro-American history, native American history; history of medicine; and history of women. Topical fields may also be arranged with the consent of the graduate advisers.

Admission. For the AM program; an average of 4.25 (A = 5.0) during the last two years of undergraduate work, a reasonable amount of course work in history, and Graduate Record Examination scores (verbal and quantitative mandatory; history optional). For the PhD program; a grade-point average of 4.5 for previous graduate-level work and Graduate Record Examination scores (as above). Undergraduate language preparation may be weighted heavily depending upon field of specialization.

Master of Arts. Candidates are expected to take at least 2 units in each of two of the fields of specialization listed above. A minimum of 8 units is required, 4 of which must be at the 400 level (excluding History 498). One of the 8 units must be History 490 (history and social theory), 491 (quantitative history), or 496 (historiography). At least one research seminar with a grade of B or better must be included. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement and may carry no more than 2 units of credit. A candidate must demonstrate ability to read one foreign language related to his or her field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the PhD degree needs a minimum of 24 units (including those offered for the AM degree), of which 8 may be for thesis research (History 499). For students who enter the graduate program without an AM in history, these must include three research seminars, History 496, either History 490 or History 491, and three additional courses at the 400 level (not including History 499). For students entering the graduate program with an AM in history, these must include two research seminars, History 496, either History 490 or History 491, and two additional courses at the 400 level (not including History 499). History 498, while required for students serving as teaching assistants, cannot be counted toward fulfilling these requirements. A candidate must demonstrate ability to read two foreign languages related to his or her field of interests, as approved by the graduate advisers. In certain circumstances, a student in American or British history may substitute courses in quantitative skills for the second language. For the preliminary examination, the candidate will customarily offer three fields in history, of which one must involve a period of time prior to 1815. At least two geographical areas must also be represented by the fields offered for the examination. One of the three fields, however, may be in a specialization outside the Department of History or may be a field of history specially designed by the candidate in consultation with the major adviser (e.g., United States intellectual or European economic history). To fulfill the minimum requirement of 24 units, 4 units in disciplines other than history may be applied.

Concentration in the Area of American Civilization. The Department of History administers an interdisciplinary doctoral program in American civilization. Students are required to take, among their 16 units prior to preliminary examinations, at least 4 units in American history, 3 in literary studies, and 3 in either the social sciences or the history of art. Course work may be arranged to allow specialization in such interdisciplinary fields as popular culture, urban studies, regional studies, folklore, film, women's studies, and minority cultures. Students may earn a master's degree in American civilization by taking 8 units, including 3 in history, 2 in literature, and 2 in either the fine arts or the social sciences. At least 4 of these units must be at the 400 level, and one should represent an interdisciplinary research project. Students apply for admission and financial aid through the Department of History.

Concentration in the Area of History, Philosophy, and Sociology of Science. The Departments of History, Philosophy, and Sociology jointly offer, for work toward the AM and the PhD degrees, a special area of concentration in history, philosophy, and sociology of science. Students interested in this program will enroll in and receive their degrees from either the history, the philosophy, or the sociology department depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history, philosophy, or sociology is usually desirable, so also is a strong background in science, and students with such backgrounds, but only weak training in history, philosophy, or sociology will be considered for admission. The admission procedure is the same as that stated for each of the three departments, as is the information to be submitted with each application for admission. For students in this special concentration, the normal departmental requirements for the AM and PhD degrees are modified. Further information is available from the Department of History.

Financial Aid. Financial aid is almost always awarded on an academic-year basis. Applications are due in the department office by February 1. All fellowships and assistantships involve a stipend plus tuition and service fee waiver.

Fellowships. Available fellowships include University fellowships for entering AM-level students and for PhD-level students at the dissertation-writing stage; Babcock, Crawford, and Krueger Fellowships for dissertation-level students; Foreign Language and Area Studies (NDEA VI) Fellowships for those who have special interests in foreign area studies; and Graduate College fellowships for beginning students who have disadvantaged backgrounds.

Teaching Assistantships. Half-time teaching assistantships are the department's primary form of financial aid to graduate students admitted to the PhD program. Students who make satisfactory progress toward their degree and demonstrate effective teaching will have their teaching assistantships renewed for a second and, in some cases, a third year.

Tuition and Service Fee Waivers. A number of tuition and service fee waivers are available each year both to entering and continuing students at the AM and PhD levels.

HISTORY, PHILOSOPHY, AND SOCIOLOGY OF SCIENCE

Graduate Degree Program. An interdisciplinary concentration in the history, philosophy, and sociology of science is available leading to the doctor of philosophy degree. Students for this program enroll in the Department of History, the Department of Philosophy, or the Department of Sociology. Further information may be obtained from those departments.

HORTICULTURE

Acting Head of the Department: W.L. George
Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 1005 Plant Sciences Laboratory, 1201 South Dorner Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.O. Dawson, D.B. Dickinson, W.L. George, J.M. Gerber, M.M. Meyer, C.A. Rebeiz, D.S. Seigler, R.M. Skirvin, W.E. Splittstoesser, L.A. Spomer, D.J. Williams
Associate Professors: T.W. Fermanian, J.A. Juvik, G.J. Kling, S.S. Korban, S.M. Ries, M.A.L. Smith, J.M. Swiader, D.J. Wehner
Assistant Professors: E.L. Kerbel, S.L. Knight, J.B. Masiunas

Graduate Degree Programs. Graduate work is offered in the Department of Horticulture leading to the master of science and doctor of philosophy degrees. Students may specialize in any phase of horticulture (fruit and vegetable crops, ornamentals, and turf) including breeding and genetics, culture and production, weeds and their control, environmental physiology, biochemistry, developmental anatomy and morphology, tissue culture, or marketing. A well-balanced program may include courses in agronomy (crops and soils), plant biology, food science, genetics, statistics, entomology, plant pathology, chemistry, biochemistry, agricultural economics, and agricultural communications.

Admission. Applicants should have a bachelor's degree in horticulture or equivalent preparation in the plant sciences and must meet the Graduate College requirements for admission.

Master of Science. A candidate must complete a minimum of 8 units of graduate study with a grade-point average of at least 4.0 (A = 5.0); at least 4 units must be in the 400 series of courses. Thesis and nonthesis options are available; however, the thesis option is preferred and is required of all research assistants. Any request for the nonthesis option is considered on its individual merit by the graduate committee of the department.

Doctor of Philosophy. The candidate must complete a minimum of 8 units of course work beyond the master's degree and pass a preliminary examination. The candidate must also complete 8 units of thesis research, submit an acceptable thesis, and defend it in an oral examination. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee.

Financial Aid. Various support moneys available on a competitive basis include University fellowships, College of Agriculture fellowships, research and teaching assistantships, and waivers of tuition and service fees.

HUMAN RESOURCES AND FAMILY STUDIES

Director of the School: Sharon Y. Nickols

Correspondence and Information: School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 274 Bevier Hall, 905 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L. Birch, B.P. Klein, J.S. DeLoache, D.K. Layman, F.M. Magrabi, S.Y. Nickols, L.B. O'Reilly, S. Salamon

Associate Professors: A.H. Beller, H.M. Buckley, B.J. Cude, N.J. Fisher, V.R. Fitzsimmons, J.L. Hafstrom, R. Hughes, R.W. Larson, J.V. Logomarsino, B.J. Peterson, M. Raheel, R.J. Reber

Assistant Professors: M.S. Brewer, M.A. Carll-White, C.J. Carpenter, S.U. Douglas, L. Kramer, K.K. Leonas, M.A. Morganosky, M.A. Paynter, M. Perry-Jenkins, S. Potter, J.J. Schmidt, K.W. Singletary, C.M. Todd, M. Weigel, J.L. Wysocki

Graduate Degree Programs. The School of Human Resources and Family Studies offers graduate work leading to the master of science, master of arts, and doctor of philosophy degrees. Master's degree programs are available in family and consumption economics, foods and nutrition, general human resources and family studies, human development and family ecology, and textiles and apparel. Requirements for these are listed under the individual programs.

For the master's degree in human resources and family studies, all candidates must complete a minimum of 8 units (9 if a thesis is not submitted), of which at least 4 must be in human resources and family studies. Four of the total units, including at least 2 in human resources and family studies, must be in 400-level courses.

The minimum grade-point average for admission is 4.0 (A = 5.0). Additional requirements are listed under the individual programs.

INDIVIDUAL DEGREE PROGRAMS

Family and Consumption Economics. The family and consumption economics programs are interdisciplinary. Admission requirements include one course in principles of economics, one course in applied statistics, and one course in calculus. Major areas of faculty research include satisfaction related to levels and standards of living and quality of living for families and individuals, management of family resources, and human capital with emphasis on the education and employment of women.

Master of Science. The MS program requires 3 units from family and consumption economics, 2 units of thesis from Family and Consumption Economics 499, 1 unit each of macro- and microeconomic theory at the 400 level, and 1 unit of research methods.

Doctor of Philosophy. Requirements include (1) 5 units from family and consumption economics; 1 unit each of macro- and microeconomic theory with a grade of at least a B in each; 2 to 4 units at the 400 level from economics or economics and agricultural economics; 2 units of statistics; 1 unit of research methods; 8 units of thesis, Family and Consumption Economics 499; (2) two of the three stages must be in residence; and (3) one written examination in family economics and one in consumption economics.

Foods and Nutrition. Major areas of faculty research interest include human nutrition through the life cycle; nutritional aspects of exercise; nutrient metabolism; nutrient composition of foods; food service systems; sensory and instrumental evaluation of food quality; food biochemistry; and use of alternative protein sources in human food.

Master of Science. There are two areas of emphasis for the MS degree: foods and nutrition, and food-service systems. For admission, candidates must have training in organic and inorganic chemistry, calculus, microbiology, and physiology, as well as undergraduate courses in both foods and nutrition. In the foods and nutrition emphasis, a course in quantitative analytical chemistry is an additional requirement for entrance. For the concentration in food service systems, introductory courses in accountancy, business administration, and economics are required. Deficiencies must be removed during the first year of graduate study. For both emphases, a minimum of 8 units, of which at least 4 must be in foods and nutrition, must be completed. Four of the total units, including at least 2 in foods and nutrition, must be in 400-level courses. Thesis topics may be in foods, nutrition, or food service systems. Specific entrance requirements and course work required for each area are given below. Additional courses may be taken in foods and nutrition or related areas.

Graduate-level courses required in the foods and nutrition emphasis include biochemistry with laboratory, biochemical nutrition, experimental study of foods and seminars in foods and nutrition. Required foods and nutrition graduate-level courses in the food-service systems emphasis include the experimental study of food; quantity food purchasing, production, management and service; and food-service systems. In addition, personnel management, business organization, and marketing courses at the graduate level are required.

Doctor of Philosophy. For admission, in addition to the prerequisites listed above for the master's degree, a candidate must have taken physics. A total of 24 units of graduate work must be completed; at least 8 and no more than 12 units of thesis research may be applied to the requirements. If a candidate has a master's degree in foods and nutrition or a related area, a minimum of 16 units, including up to 12 units of thesis research, must be completed. Required courses include at least 3 units of foods and nutrition, of which at least 2 must be at the 400 level. Students must take seminars in foods, nutrition, or food service systems. Other courses are selected, in consultation with the adviser, on the basis of the student's background and interests. Courses may be chosen from foods and nutrition, food science, biological and chemical sciences, statistics, or other related areas. Thesis topics may be in foods or nutrition.

General Human Resources and Family Studies. The master's program in general human resources and family studies allows the candidate to obtain greater breadth than is possible in one of the more specialized areas. Candidates are required to take a minimum of 4 units from prescribed courses in three of the five specialized fields in human resources and family studies. Students interested in interior design are advised in this program.

Interior Design. For the MS or MA with a concentration in interior design, the student may specialize in the study of design, the history of furniture and interiors, environmental analysis, or a closely related topic. Major areas of faculty research include: residential and commercial interior design, period or adaptive re-use restoration, history of furniture and interiors, and personal space. An applicant should have an undergraduate major in interior design or a background in a related field. Deficiencies should be made up during the first year of graduate study. Basic courses in art, natural sciences, economics, sociology, psychology, interior design, and textiles are essential. The master's degree with a concentration in interior design may be completed with a thesis or design problem. The graduate program must include Interior Design 485, 493, and 499, and a minimum of 2 additional units in interior design at the graduate level.

Home Economics Education. The MS program in home economics education requires that candidates hold a valid teaching certificate for home economics or have successfully completed Illinois certification requirements, and earn at least 8 units of graduate credit, of which 4 units are in human resources and family studies. Three of the 8 units must be at the 400 level, with at least 1 of these in human resources and family studies. Four ½-unit courses are specified in educational psychology and educational policy studies. At least 2 units must be in home economics education. Advisers for students in this program are in the Division of Home Economics Education, College of Education. A thesis is recommended.

Human Development and Family Studies. The degree programs are interdisciplinary, focusing on individual development across the life span and on the family context in which development occurs. Major areas of faculty research in human development include childhood and adolescence; in family studies, emphases include family systems, the family in cross-cultural settings, and the relationship between the family and other institutions in society.

Admission. Admission into all programs is based on a combination of criteria. All applicants are required to submit Graduate Record Examination scores and have previous course work in an area of the behavioral or social sciences. A student without prior course work in human development, family studies, and advanced-level research methods and statistics may be admitted to a graduate program, but will be required to make up deficiencies during the first year of the program.

Master of Science or Master of Arts. For the MS or AM degree, the student may specialize in the study of either the family or human development. The program is designed to prepare students as practitioners in education and social service agencies, or as the first step toward the doctor of philosophy degree. Students must complete a minimum of 8 units, including 2 units of thesis, or 9 units if the thesis is not submitted; 4 of the total units must include HDFS 418 and 419 and two other 400-level courses.

Master of Science and Master of Social Work. A joint master's degree program offered in conjunction with the School of Social Work, is designed to prepare students for careers as marital and family therapists within a human service agency, or as independent practitioners, teachers, or clinical researchers. For admission to the MS/MSW joint degree program, students must apply to both the Division of Human Development and Family Studies and the School of Social Work, and must meet the standards for admission and be approved by both. Completion of the program meets the requirements for associate membership in the American Association for Marriage and Family Therapy. Students in the HDFS phase of the program take course work in family studies, human development, and family systems to fulfill the requirements for the MS. They then fulfill requirements for the MSW. Students who hold a BSW degree must complete a minimum of 20 units of course work to satisfy requirements for the MSW and MS degrees. Students with baccalaureate degrees in other disciplines may need to complete up to 22 units if they lack certain social work credits as undergraduates.

Doctor of Philosophy. The program is designed to prepare students to be researchers, educators, policy developers, or practitioners in human services delivery. Requirements for the PhD include 16 units beyond the MS or MA, a predissertation research paper, a preliminary written examination designed by the student's faculty committee, an examination of the dissertation prospectus, and a final oral defense of the dissertation. The student selects human development or family studies as the major area of concentration; the other division area serves as a minor area of concentration. A cognate area is selected from outside the division. Course work in areas such a anthropology, family economics, sociology, psychology, educational psychology, early childhood education, or social work, selected in consultation with the student's adviser can satisfy program requirements within the student's area of specialization and in the cognate area. At least 2 units in advanced research methodology and/or statistics, HDFS 420, HDFS 421, and 8 units of thesis are required.

Textiles and Apparel. For the MS or MA degree in textiles and apparel, the student may specialize in the study of the aesthetic aspects of apparel, economics, international studies, the social psychology of dress, textile science, or textiles and apparel marketing. Major areas of research include aesthetic theory, cognitive and interpersonal factors influencing apparel selection and perceptions of dress, consumer behavior, consumer values, labor and technology in the apparel industry, performance evaluation of consumer textile products, protective clothing, and safety aspects of textiles.

Master of Science or Master of Arts. Admission requirements include a background in textiles, apparel, and associated courses. Deficiencies should be made up during the first year of graduate study. The graduate program must include a minimum of 8 units, or 9 units if a

thesis is not submitted; at least 4 of the total units must be in textiles and apparel and 4 at the 400 level. A graduate-level statistics and a research methods course are also required. Additional courses are selected in accordance with the special interests of the student.

Financial Aid. University fellowships and fellowships in the College of Agriculture and the School of Human Resources and Family Studies, tuition and service fee waivers, research assistantships, and teaching assistantships are available in several programs.

JOURNALISM

Head of the Department: Steven Helle
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: J. Carey, C. Christians, T. Littlewood
Associate Professors: S. Helle, C. Llerena-Aguirre, R. Reid, J. Thomas, C. Whitney

Graduate Degree Program. The Department of Journalism offers graduate work leading to the master of science degree. The department does not offer a PhD degree. For the program leading to the Doctor of Philosophy in Communications, see page 78.

Admission. Applicants must have a bachelor's degree from an accredited U.S. institution or one of recognized standing abroad. A grade-point average of 4.0 (A = 5.0) is the minimum requirement for admission to the Graduate College, with exceptions by petition only. Because the master's program has an enrollment ceiling, some applicants with grade-point averages of 4.0 or higher may not be admitted. It is imperative that all applicants supply writing samples, and applicants for the braodcast sequence should supply an audio cassette tape of themselves reading a news story. Letters of recommendation and the Graduate Record Examination are required. If possible, a personal interview with the head of the department or director of graduate studies is also helpful.

Master of Science. The following are requirements for the degree: (1) A major of 4 units or 3 units and 1 additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience are required to complete 1 unit of news editing (either news-editorial or broadcast news editing), 2 units in news writing, and 1 unit of either graphics and photojournalism, television, or radio news production. (2) A thesis, or preparation of a topic in journalistic form for publication or broadcast, for 1 unit. (3) A minimum of 3 units in courses at the 400 level, at least 2 of which must be in journalism. (4) A minimum total of 8 units with a grade-point average not lower than 3.875.

Financial Aid. See the description of the University fellowship and tuition and service fee waiver program in the introductory section of this catalog. Assistantships (teaching or research) are awarded on a quarter-time to half-time basis and carry a waiver of tuition and some fees. To be considered for financial aid, applications, including transcripts and three letters of recommendation, must be received no later than February 15. Students with journalism degrees or professional experience may become candidates for part-time positions in other units of the University that require journalistic skills in writing, editing, and/or photography and graphics.

KINESIOLOGY

Head of the Department: Karl M. Newell
Correspondence and Information: Director, Graduate Studies Program Office, Department of Kinesiology, University of Illinois at Urbana-Champaign, 225A Freer Hall, 906 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.J. Adrian, R.A. Boileau, S.L. Greendorfer, J.W. Loy, G. Lueschen, D.O. Matthews, K.M. Newell, G.C. Roberts, R.G. Wright

Associate Professors: L.G. Carlton, P.N. Kugler, E. McAuley, J.M. Misner, M. Slaughter, M. Trekell

Assistant Professors: G.W. Bell, H. Deutsch, L.L. Ji, A. Katz, I.C. Rovegno, G. Riccio, S. Slowikowski, R. Stillman

Graduate Degree Programs. The Department of Kinesiology offers graduate work leading to the degrees of Master of Science in the Teaching of Kinesiology, master of science, and doctor of philosophy. Major areas of specialization at both the master's degree and doctoral degree level include: (1) the biodynamics of physical activity—the study of work output, energy, and efficiency of movement, undertaken to better understand the nature of exercise stress, the mechanics of human movement, and fitness throughout the human lifespan; (2) the social science of physical activity—the study of the antecedants and consequences of involvement in physical activity and sport as well as the impact that physical activity and sport have upon individuals, society, and culture; (3) coordination, control, and skill—the study of the mechanisms and processes involved in the coordination, control, and skill of human physical activity. Areas of specialization at the master's level only also include pedagogical kinesiology (the study of the organizational and instructional concepts essential for the efficient and effective conduct of physical activity programs, particularly those that relate to physical education and sport contexts) and therapeutic kinesiology (the study of movement as a therapeutic vehicle for health and wellness, particularly the prevention and rehabilitation of injury or movement function).

Master of Science in the Teaching of Kinesiology. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, eligibility for teacher certification in Illinois, a minimal total score of 1500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for individuals who wish to advance their teaching competencies. Candidates for this degree must complete a minimum of 8 units, 4 of which must be in kinesiology and 2 in education courses. Three of the total units must be in 400-level courses. Of the 4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. Information concerning the specific requirements of the 2 units in education may be obtained from the graduate studies office of the department. No more than 2 units of graduate study from another institution can be transferred. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A thesis is not required.

Master of Science. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, a minimal total score of 1500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. Candidates for this degree must complete a minimum of 8 units, 4 of which must be completed in kinesiology. Each student must identify a major area of study from the following list: biodynamics; coordination, control, and skill; social science of physical activity; therapeutic kinesiology; pedogogical kinesiology. At least 2 units must come from the identified major area of study; and 1 unit must be taken from one additional area of study in the department. Of the total units, 3 must comprise 400-level courses. Of the 4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. No more than 2 units of graduate credit from another institution can be transferred. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A student may choose to write an acceptable thesis for 2 units of credit (i.e., Kinesiology 499) or select a nonthesis option by substituting 2 units of credit (i.e., approved credit that includes at least 1 unit of Kinesiology 493 [Independent Study]).

Doctor of Philosophy. Admission to this degree program requires a master's degree from an accredited institution of higher education, completion of a thesis or equivalent research experience, a minimum grade-point average of 4.5 (A = 5.0) for all graduate work, a minimal total score of 1800 on aptitude portions of the Graduate Record Examination, and three letters of recommendation. Doctor of philosophy degree candidates pursue an advanced program of study and research in preparation for careers in research and teaching. Candidates must complete 16 units of work beyond the master's degree, including 2 units in other disciplines and 8 units of thesis research. Each student must choose a major area of study from the following: biodynamics; coordination, control, and skill; or the social science of physical activity. PhD candidates are required to demonstrate competence in research methodology appropriate to their area of study. They must also successfully complete the preliminary and final doctoral examinations.

Research Facilities. In support of its graduate programs and research efforts, the Department of Kinesiology maintains the Physical Fitness Research Laboratory and several research laboratory facilities in biomechanics, motor control and sport psychology.

Financial Aid. A number of teaching assistantships are available in the department's instructional programs. A limited number of research assistantships are available to support the departmental research laboratories. Assistantships usually provide a stipend for services performed, as well as a tuition and partial fee waiver.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: W. Franke
Correspondence and Information: Associate Director, Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: F.D. Blau, G. Ferris, P. Feuille, W. Franke, P. Hartman, W. Hendricks, C. Hulin, L. Kahn, G. Oldham, M. Rothbaum, K. Taira, H. Triandis
Associate Professors: F. Drasgow, J. Lawler
Assistant Professors: P. Carnevale, J. Martocchio, P. Sherer
Emeritus Professors: M. Derber, W. Form, B. Karsh, M. Wagner

Graduate Degree Programs. The Institute of Labor and Industrial Relations (ILIR) offers graduate work leading to the master of arts and doctor of philosophy degrees. Students must meet the general admission requirements of the Graduate College as well as the specific requirements of the institute.

Graduate study at the institute is based on a multidisciplinary approach to industrial relations problems and a flexible curriculum. To achieve this, the institute has joint faculty appointments and course listings with economics, psychology, sociology, and business administration; and joint course listings with law, political science, vocational education, and social work.

Master of Arts. The master's program can lead to a professional, terminal AM degree, or it can prepare students to continue their graduate study toward a PhD degree or doctoral degrees in law and other professional areas. The fields of concentration are: unions, management, and labor relations policy; organizational behavior and personnel management; and labor markets and employment.

The institute offers a number of program options for the AM degree. All options require a minimum of 10 units of work and usually take three semesters to complete. All of the master's degree programs have core requirements in industrial relations systems, quantitative methods, and research methods.

Admission to the master's program is based on an applicant's undergraduate record, letters of reference, Graduate Record Examination scores, and statement of interest and goals.

Usually, the minimum requirements for admission are a course in statistics and an average grade of B in the last 60 hours of undergraduate work. A deficiency in statistics may be made up by taking the required course without graduate credit during the first semester of graduate study.

Joint JD/AM. The joint degree program with the College of Law leads to the JD and the AM degrees in labor and industrial relations in three-and-one-half years. Students must apply to both the College of Law and the Institute of Labor and Industrial Relations and must be accepted by both units.

Doctor of Philosophy. The PhD program in labor and industrial relations is an interdisciplinary research degree. An individual program is built around the student's area of specialization. It includes industrial relations theory, research methodology, and course work both in a major social science discipline and in other professional and disciplinary subjects relevant to the interdisciplinary area of specialization. Examples of areas of specialization include: government employer-employee relationships; labor in politics; economic effects of collective bargaining; discrimination in employment; wage policy issues in economic development; motivation, morale, and job satisfaction; international comparative industrial relations systems; behavior in union and management organizations; interorganizational relations; work design; pay systems; cross-cultural issues in industrial relations; and structural and technological determinants of human behavior. The PhD degree requires 24 units of credit beyond the baccalaureate degree, satisfactory completion of qualifying examinations in industrial relations theory and the area of specialization, and a thesis.

A student interested in earning a PhD degree after receiving a master's degree at the institute should indicate this fact on the application for admission. Students with outstanding undergraduate records or with a master's degree from another institution may apply for entrance directly to the doctoral program. The degree should be in labor and industrial relations or an allied field such as business administration, economics, history, sociology, political science, or psychology. The applicant should submit with the application evidence of research competence (master's thesis, term papers, an undergraduate thesis, special reports, or published articles). All papers will be returned.

Financial Aid. The institute offers research assistantships and fellowships to high-ranking graduate students and to new students whose undergraduate records are superior. A research assistant receives a salary plus exemption from tuition and some fees. The Graduate College also awards fellowships that carry stipends plus tuition and service fee waivers. Tuition and service fee waivers may also be granted but do not carry a stipend.

LANDSCAPE ARCHITECTURE

Head of the Department: V.J. Bellafiore
Coordinator of the Graduate Program: Terence G. Harkness
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 214 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: V.J. Bellafiore, T.G. Harkness, L.D. Hopkins, J.A. Jakle, W.M. Keith, R.B. Riley, E.S. Weidemann
Associate Professors: J.V. Hammond, G.B. Kesler, B.A. Orland
Assistant Professors: C. Emmerling-DiNovo, L.A. Irvine, D.M. Johnston, D.A. Kovacic

Graduate Degree Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture degree. The program is designed to enable students to gain fresh insights and to experiment with new applications pertaining to land and its use by people. Courses and faculty research activities range from at-site to regional scales and include land resources planning and design, and behavioral and cultural factors in design.

The scope of work may include ecological and behavioral assessment, human perception, and comprehensive computer-based methods. Before submitting an application, students should obtain a pamphlet from the department that describes the specific areas of study and the time needed to complete the requirements.

Admission. The Graduate College admission requirements apply, except that higher TOEFL scores are required for international students. Students are admitted on an individual basis according to a review of their prior accomplishments with an emphasis on academic achievement. Candidates from undergraduate design programs must submit samples of their design work with their applications. Candidates without undergraduate preparation in landscape architecture will be admitted on limited status and must complete undergraduate prerequisite courses in addition to graduate work.

Master of Landscape Architecture. A student must complete a minimum of 12 units with at least 6 units taken within the department and at least 3 units of electives chosen from courses offered outside the department. At least 4½ units must be taken in 400-level courses. Specific courses to be taken are determined in consultation with an adviser. These courses culminate in a master's thesis (Landscape Architecture 499) that permits the student, under the approval and supervision of a faculty committee, to pursue independently an in-depth work of particular relevance for landscape architecture.

Financial Aid. Students compete for fellowships, tuition and service fee waivers, and assistantships.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center: Enrique Mayer
Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W. Baer, W. Blaylock, F. Boyle, C. Deal, R. Findley, E. Garfield, D. Grove, D. Lathrap, S. Lo, J. Love, R. Reisner, S. Schmidt, I. Schulman, R. Scott, J. Thompson, J. vanEs, N. Whitten, R. Zuidema
Associate Professors: A. Aiex, C. Augspurger, P. Borgeson, D. Coes, P. Garber, N. Gonzalez, E. Mayer, E. McClure, T. Meehan, M. Palencia-Roth, M. Solaun, W. vanPatten, J. Warfield
Assistant Professors: S. Brown, D. Grynspan, N. Jacobsen, J. Lee, A. Metz, P. Sharpe-Valadares, H. Silverman, T. Turino, M. Weigel

Graduate Degree Programs. Graduate minors in Latin American and Caribbean studies are administered by the director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin American and Caribbean studies must complete 2 units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete 4 units for one minor or 2 units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center. A combined graduate program in agricultural economics and foreign area studies (in this case, Latin American studies) is also available.

Students in technical and professional colleges and schools of the University of Illinois at Urbana-Champaign who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the director of the center or with their advisers in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American and Caribbean area for government, private business, publishing, or religious organizations.

A high level of proficiency in one or more languages of the region (Spanish, Portuguese, and Indian languages) is required. For course information, requirements, and methods used to establish the level of proficiency, please contact the student adviser or center director.

Language Instruction. The center offers Quechua, the native language spoken by 13 million people in the Andean republics.

Financial Aid. The center is a recipient of Federal Government Title VI Foreign Language and Area Studies (FLAS) Fellowships for Graduate Studies in any discipline that includes a minor in Latin American studies and an intensive program of language instruction. Summer fellowships for intensive language courses abroad or in the United States are available. Small travel grants for graduate students wishing to do research during the summer are also available on a competitive basis. Both these programs depend on outside funding and thus cannot be guaranteed in any given year.

LAW

Acting Dean of the College: Roger W. Findley
Director of Graduate and International Legal Studies: R. Reisner
Correspondence and Information: Office of Graduate and International Legal Studies, University of Illinois at Urbana-Champaign, 105 Law Building, 504 East Pennsylvania Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: M.W. Benfield, F.A. Boyle, G. Bradley, W.J. Davey, R.W. Findley, M.W. Finkin, E.T. Freyfogle, O.F. Harris, S.L. Harris, P. Hay, R.L. Kaplan, H.D. Krause, W.R. LaFave, P.B. Maggs, J.H. McCord, J.E. Nowak, R. Reisner, R.D. Rotunda, E.W. Shoben, V.J. Stone
Associate Professors: D.A. Dripps, K. Kinports, T.M. Mengler, A.L. Merritt, D.J. Merritt, L.A. Reynolds, S.F. Ross, C.J. Tabb, T.S. Ulen
Assistant Professors: S.M. Bainbridge, J.D. Colombo, J.E. Pfander

Programs of Graduate Study. Programs of graduate study in law are designed for law graduates who wish to pursue advanced study and conduct independent research under the direction of the College of Law faculty. Three advanced degrees are conferred by the College of Law; the degree of Master of Comparative Law (MCL), the degree of Master of Laws (LLM), and the degree of Doctor of the Science of Law (JSD). Since each of these degrees differs substantially from the others in terms of purpose and curricular requirements, admission is specific as to a particular degree program. Overall coordination of the graduate program is the responsibility of the director of the Office of Graduate and International Studies, and individual inquiries should be addressed to this office.

Master of Comparative Law (MCL). The degree of Master of Comparative Law is designed primarily for foreign lawyers or law teachers who wish to increase their knowledge of the Anglo-American common law system and engage in comparative legal research.

Candidates for the MCL must complete a minimum of 8 units of study in law. With the exception of one course entitled Introduction to U.S. Law, 6 units of the 8-unit requirement will consist of regular law courses to be selected from among the curricular offerings of the College of Law. (A description of these courses may be found in the section entitled "Description of Courses" in the College of Law catalog.) The remaining two units may consist of independent research or a reading course to be taken under faculty supervision.

Master of Laws (LLM). The Master of Laws (LLM) degree is open to graduates of U.S. law schools or students from other jurisdictions, including civil law countries, who have completed studies leading to the basic law degree.

For students whose prior legal studies were in a common law jurisdiction, the requirements consist of 4 units of course work and 4 units of research leading to a dissertation. Candidates from common law jurisdictions must elect 4 units of course work from among the courses offered in the second- or third-year curriculum (see Description of Courses in the College of Law catalog). Upon petition, law-related courses offered by other University departments may be counted as credit toward the LLM degree.

Candidates whose basic law training was taken in a civil law or other non–common law

jurisdiction, must complete a total of 8 units of course work, including a special course: Introduction to U.S. Law. The remainder of the 8 units must be selected from any of the regular courses offered in the law school curriculum. A dissertation for those who have graduated from a non–common law jurisdiction is not required.

Doctor of the Science of Law (JSD). Applicants may be considered for admission into the JSD program only upon the completion of at least two semesters of graduate study in law at the University of Illinois at the master's level. Admission into the program will be based on the level of the applicant's performance in courses and research taken during the period in residence as well as his or her demonstrated ability for independent research and writing.

The requirements for the JSD degree consist of the preparation of a dissertation of publishable quality and a program of study prescribed by the Committee on Graduate and International Studies. This program of study includes, as an essential element, research and writing under faculty supervision in areas related to the candidate's JSD thesis. In addition, candidates will generally be required to take those courses and seminars from among the College of Law course offerings that relate to the candidate's dissertation topic. After submission of the dissertation, the candidate must pass an oral examination in defense of the dissertation before a doctoral committee of the faculty specifically convened for that purpose.

Financial Aid. The College of Law offers six instructorships to students whose backgrounds have been in the Anglo-American common law system and four research assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and service fees are available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by February 1.

LEISURE STUDIES

Acting Head of the Department: Joseph J. Bannon
Correspondence and Information: Head, Department of Leisure Studies, University of Illinois at Urbana-Champaign, 104 Huff Gymnasium, 1206 South Fourth Street, Champaign, IL 61820
Professors: J.J. Bannon, R.J. Burdge, J.R. Kelly, G.C. Roberts
Associate Professors: L. Barnett Morris, D.J. Brademas, G.E. Chick, R.D. Espeseth, D.A. Kleiber, W.R. McKinney
Assistant Professors: J.D. Burnam, J.J. Sneegas
Emeritus Professor: A.V. Sapora

Graduate Degree Programs. The Department of Leisure Studies offers a program of study leading to the master of science and the doctor of philosophy degrees. The master of science program prepares supervisors and administrators for public parks and recreation systems, treatment centers for the ill and disabled, and various private and semipublic settings providing leisure services. The MS degree may also serve as the first step toward the PhD program. The PhD program is, in general, designed to develop educators and research personnel in the study of leisure behavior, the management of systems that provide leisure services, or both.

Admission. The Graduate College admission requirements apply. The departmental graduate committee considers the candidates' maturity, experience, and commitment to the field in making admission decisions. Specifically, the admission requirements are as follows: minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed; satisfactory verbal, quantitative, and analytical Graduate Record Examination scores; and an acceptable introductory statistics course. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Science. A candidate for the MS degree must spend at least one semester on campus and complete a minimum of 8 units, 3 of which must be in the 400 series and 2 of

the 3 in leisure studies; 4 of these units should be in the student's area of specialization. A thesis may be written for 2 units of credit. A full-time student can complete the program in three or four semesters.

Doctor of Philosophy. A candidate for the PhD degree must spend at least two years in residence and satisfactorily complete a minimum of 16 units beyond the master's degree. These units include the credit for the PhD thesis. Departmental requirements include satisfactory performance on the doctoral qualifying examination, the written preliminary examination at the completion of formal course work, the oral preliminary examination on the proposed research for the thesis, and a final examination in defense of the doctoral thesis.

Financial Aid. The department offers quarter-time and half-time assistantships in both teaching and research. If possible, students should indicate a desire for this type of part-time employment when applying for admission.

LIBRARY AND INFORMATION SCIENCE

Dean of the Graduate School of Library and Information Science: Leigh S. Estabrook
Correspondence and Information: Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, 410 David Kinley Hall, 1407 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: M. Brichford, M.T. Choldin, C.H. Davis, L. Estabrook, K.L. Henderson, D.W. Krummel, F.W. Lancaster, S. Richardson, M. Williams
Associate Professors: M. Siegel, L. Smith, P. Stenstrom, T.L. Weech
Assistant Professors: B. Allen, P. Dalrymple, L. Edmonds, J.B. Sutton

Graduate Degree Programs. The Graduate School of Library and Information Science offers programs of study leading to the master of science, the certificate of advanced study, and the doctor of philosophy degrees. The master of science degree program prepares men and women for professional careers in all types of libraries and information centers. The certificate of advanced study program provides the opportunity (a) to study an aspect of library and information science in greater depth than is possible in the master of science program, (b) to refresh and upgrade one's professional training several years after the master of science program or (c) to redirect one's career into a different area of library and information science. The doctor of philosophy is a research degree program.

Admission. In addition to the general admission requirements of the Graduate College, consideration is also given to language study, relevant work experience, letters of reference, Graduate Record Examination aptitude test scores, and evidence of leadership. International students must score at least 600 on the Test of English as a Foreign Language. The certificate of advanced study and doctor of philosophy programs require a master's degree in librarianship from a library school with an A.L.A.-accredited program and a grade-point average of at least 4.0 (A = 5.0) in the master's program. For the doctor of philosophy program, two years of library work experience at the professional level and an interview with the school's advanced studies committee are also required.

Master of Science. The MS degree requires of all students: 10 units of graduate study, including 1 unit of Library and Information Science 300, ½ unit of Library and Information Science 307, and ½ unit of Library and Information Science 320. Possible areas of specialization include all main types of libraries (e.g., academic, public, school, and special), all main types of work in libraries (e.g., cataloging, reference, and children's services), plus other concentrations such as information science, library automation, rare books, and archives. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A thesis is not required but is available as an option. A minimum of twelve months is required to complete the master's program.

Certificate of Advanced Study (CAS). The certificate is awarded upon the successful completion of 10 units of graduate course work beyond the master's degree. Of the 10 units, at least 6, including Library and Information Science 459 (CAS Project), must be in library and information science. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A minimum of twelve months is required to complete the CAS program.

Doctor of Philosophy. The program consists of three stages: (1) generalization (9 units of course work required of all doctoral students), (2) specialization (3 or more units of elective course work plus a research tool), and (3) thesis (8 or more units). Thus, a minimum of 12 units of graduate course work plus 8 units of thesis credit are required. A minimum of two years is required to complete the necessary course work; an additional year or more, preferably in residence, is required for the thesis. A 4.5 GPA is the minimum for the four required seminars.

Financial Aid. Financial aid may be available from the school, the University of Illinois Library, area libraries, and the like, in the form of graduate assistantships, preprofessional positions, and hourly paid work. Also, the school has a limited number of fellowships and tuition waivers for which doctoral students tend to be favored over CAS and master's students.

Research Interests, Facilities, and Resources. Major areas of faculty research interest include bibliography, cataloging and classification, information storage and retrieval, library automation, nonprint media, library services for children and young adults, and reference tools and services. The school's Library Research Center engages in applied and pure research on contract; staff members of the Library Research Center are available to students and faculty for consultation and guidance. A minicomputer network and CD-ROM system are integral to teaching and learning activities. The University of Illinois Library provides a vast reservoir of resources for all types of study and research in library and information science.

The school maintains an ongoing commitment to continuing education through conferences, institutes, workshops, and special course offerings. Of particular note are the annual Allerton institutes and clinics on library applications of data processing. An extensive publications program includes the annual *Proceedings* of each of these, plus *Library Trends, Occasional Papers* and a variety of monographs.

LIFE SCIENCES

(Including Interdepartmental Biology Programs; Cell and Structural Biology; Ecology, Ethology, and Evolution; Entomology; Microbiology; Physiology and Biophysics; and Plant Biology)

Director of the School: Jordan Konzsky

Correspondence and Information: Director, School of Life Sciences, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

Graduate Degree Programs. The School of Life Sciences (SOLS) includes the Departments of Cell and Structural Biology; Ecology, Ethology, and Evolution; Entomology; Microbiology; Physiology and Biophysics; and Plant Biology. Study programs leading to the graduate degrees of master of science and doctor of philosophy exist in each of the departments and are described in detail on the following pages. In addition, interdepartmental study programs leading to the PhD degree in neural and behavioral biology, and physiological and molecular plant biology are administered within the school.

Financial Aid. Support for graduate training is available in the form of teaching or research assistantships and University fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department or for interdepartmental study programs from the School of Life Sciences.

A training grant is available from the National Institutes of Health for the support of the exceptional student with interests in the molecular basis of cellular processes. Research areas include molecular genetics, cell structure and function, molecular structure, gene expression, developmental biology, cell differentiation and virology. Candidates are selected for the grant from students already admitted to degree-granting programs in the SOLS (or certain other units of the University). Students who are accepted will receive a stipend and be designated NIH predoctoral trainees. They must fulfill the requirements of the degree program into which they are accepted as well as some additional courses that constitute a core program as designated by the grant. Other grant-sponsored activities include a seminar series and research presentations.

Interdepartmental Biology Programs

Director of Biology Programs: S. Friedman
Correspondence and Information: Biology Programs, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

Graduate Degree Programs, Admission. The SOLS maintains two interdepartmental PhD programs: one in neural and behavioral biology and a second in physiological and molecular plant biology. Two master's programs (MS in Biology and MS in the Teaching of Biological Sciences and General Science) are also offered. To be considered for any program, an applicant must have an overall grade-point average of 4.0 (A = 5.0), must include a brief statement of educational objectives with the formal application, and must submit three letters of recommendation. GRE scores are mandatory for consideration for the PhD programs and the MS teaching program.

Master of Science in the Teaching of Biological Sciences and General Science. This program is designed for graduates who intend to enter the teaching profession and for individuals already teaching biology or general science in junior high school, high school, or junior college. The degree is awarded upon completion of a minimum of 8 units of credit and proof of state teacher certification. Course work consists of 4 units in biological sciences, 2 units in education (see page 84) and 2 elective units. Electives are usually taken in biological sciences and/or education.

Master of Science in Biology. This program is intended for students who wish to increase their knowledge of biology and become involved with graduate-level research in biology without the long-term commitment of a PhD program. The work plan is personally designed by each student in consultation with an appropriate adviser. Breadth of training is encouraged. (For those wishing to concentrate their efforts, MS programs are available in most of the departments in the School of Life Sciences.) The degree requires 8 units, of which 3 must be in 400-level courses. Active status in the program is maintained through registration in two 300- or 400-level biology courses per semester and a grade-point average of at least 4.0 (A = 5.0). A research report is required of all candidates for the degree. Before the degree will be granted, the student must also complete or show college credit for the following: one year of physics with laboratory, a course in organic chemistry with laboratory, and a semester of calculus.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in two interdisciplinary areas: neural and behavioral biology and physiological and molecular plant biology. Entrance requirements include courses in biology, physics, biochemistry, and calculus, but deficiencies in these areas may be remedied in the first year of graduate work. Course work leading to each degree is formulated in consultation with program-associated advisers.

*Neural and Behavioral Biology.** This multidisciplinary program includes staff members from physiology; psychology; biochemistry; biophysics; cell and structural biology; entomology; ecology, ethology, and evolution; engineering; veterinary medicine; and basic medical sciences. The program is heavily research-oriented with individually tailored plans of study designed to provide students with a strong background in the collective disciplines of

*A proposal is pending to change the name to Neurosciences.

neurobiology and in the students' specific areas of concentration. Research areas include neuroanatomy, neurochemistry, neuroendocrinology, neurobiological development and genetics, neurophysiology, membrane biophysics, neuroethology, and physiological psychology.

Physiological and Molecular Plant Biology. This program is staffed by plant physiologists from six departments: agronomy, forestry, horticulture, physiology and biophysics, plant biology, and plant pathology. Thesis research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen metabolism, plant hormones, herbicide action, molecular biology of chloroplasts, water relations, environmental physiology, and disease physiology.

Additional information on the Biology Programs may be obtained from the School of Life Sciences.

Cell and Structural Biology

Head of Department: A.F. Horwitz

Correspondence and Information: Department of Cell and Structural Biology, University of Illinois at Urbana-Champaign, 506 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.T. Greenough, A.F. Horwitz, B. Katzenellenbogen, B. Kemper, C.R. Leeson, C.C.C. O'Morchoe, P.J. O'Morchoe, D.M. Steffensen, D.L. Stocum

Associate Professors: J.A. Cameron, W.L. Daniel, M.A. Holzwarth, S.J. Kaufman, L.L. Klepinger, A. Kokko-Cunningham, S. Lazarowitz, J.E. Mittenthal, J.A. Weyhenmeyer

Assistant Professors: A. Belmont, R. Blackman, C. Doe, J.A. Kaput

Graduate Degree Program. The Department of Cell and Structural Biology administers a graduate degree program as an option in biology. Departmental faculty are concerned with the structural and functional relationships of cells and organisms with research emphases upon animal cell and molecular biology, neurobiology, structural biology, and developmental biology.

Admission. Applications are evaluated on an individual basis. The formal entrance requirement is a minimum grade-point average of 4.0 (A = 5.0). Important factors in the evaluation of applications are general academic performance, background in the biological and chemical sciences and mathematics, graduate record examination scores, and letters of recommendation from college professors. Although applications from qualified students are considered throughout the year, deadline for submission of applications for fall semester is February 15.

Doctor of Philosophy in Biology: Cell and Structural Biology Area of Specialization. The program leads to the doctor of philosophy degree. In order to successfully complete the graduate program in cell and structural biology, the student must fulfill requirements in the following categories: course work, a qualifying examination, a preliminary oral examination, defense of the thesis, teaching, and departmental seminars. A brochure providing additional information about the program is available upon request.

Financial Aid. Financial aid is available to a limited number of qualified applicants in the form of 1) University fellowships and tuition and fee waivers, awarded on a competitive basis; 2) teaching assistantships awarded by the department; and 3) research assistantships, allotted by individual faculty members with research funds available for this purpose. Exceptional students will qualify for support from the Cell and Molecular Biology Training Program. Financial packages can be assembled from two or more of the above sources for qualified candidates.

Ecology, Ethology, and Evolution

Acting Head of the Department: L.L. Getz

Correspondence and Information: Department of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign, 515 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.O. Batzli, R.W. Burkhardt, N. Burley, T.H. Frazzetta, L.L. Getz, A.W. Ghent, J. Hirsch, D.L. Nanney, L.M. Page, D.P. Philipp, S.L. Portnoy, M.Salmon, G.C. Sanderson, G.S. Whitt, C.R. Woese

Associate Professors: E.E. Herricks, G.H. Kieffer, R.P. Larkin, S.K. Robinson, P.E. Ross, D.C. Sweeney, T. Uzzell, S. Yokoyama

Assistant Professors: K.N. Paige, D.H. Wahl

Graduate Degree Programs. The Department of Ecology, Ethology, and Evolution administers graduate degree programs as options in biology. Areas of training include physiological, population, community, and evolutionary ecology; ethology, physiological mechanisms of behavior, and behavior-genetics; evolutionary biology, population genetics, karyotypic and molecular analysis, functional anatomy, and systematics; quantitative analysis of genetic and ecological systems; and resource management.

Admission. Acceptance for graduate study in ecology, ethology, and evolution is based on the applicant's research potential and academic achievement. An undergraduate degree in the life sciences is the usual preparation, but students majoring in mathematics, computer science, or the physical and social sciences are also considered. Courses required for admission are inorganic and organic chemistry, biochemistry, a year of physics, and mathematics through calculus. Students lacking one or more of these courses may be admitted with the provision that such deficiencies be completed in addition to the normal graduate course load. A grade-point average of at least 4.0 (A = 5.0) for the last 60 hours of undergraduate work and for any graduate study is mandatory, and good scores on the Graduate Record Examination are necessary. Considerable emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. With approval of the MS biology committee, students in ecology, ethology, and evolution may pursue an MS degree in biology under the supervision of a departmental adviser (see Master of Science in Biology, page 119).

Doctor of Philosophy in Biology: Ecology, Ethology, and Evolution Area of Specialization. Candidates for the PhD degree must demonstrate excellence by examination and, in consultation with an adviser and doctoral committee, plan and carry out original thesis research with distinction. A qualifying examination covering general knowledge is given in the second year of the student's program, and a preliminary examination assessing the feasibility and significance of the thesis research is given three semesters later. Courses in both statistics and computer science are required, and proficiency in one or more foreign languages may be required depending on the field of research. Additional requirements may be prescribed by the adviser and doctoral committee. A final examination, in which the student defends the thesis, and a presentation of the thesis at a departmental seminar complete the program.

Entomology

Head of the Department: Stanley Friedman

Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: S. Friedman, A.W. Ghent, W.R. Horsfall, M.E. Irwin, M. Kogan, W.E. LaBerge, R.L. Metcalf, W.G. Ruesink, D.S. Seigler, R.B. Selander, J.G. Sternburg, G.P. Waldbauer, J.H. Willis
Associate Professors: M.R. Berenbaum, S.H. Berlocher, F. Delcomyn, E.G. MacLeod, J.V. Maddox
Assistant Professors: H.M. Robertson, G.E. Robinson

Graduate Degree Programs. The Department of Entomology offers graduate work leading to the master of science and doctor of philosophy degrees.

Admission. The Graduate College admission requirements apply. Previous training in entomology is not necessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Master of Science. A candidate for the MS degree is expected to become knowledgeable in entomology through course and field work and to complete a research thesis in an area of interest chosen in consultation with an adviser. The grade-point average required for degree certification is 4.0 (A = 5.0).

Doctor of Philosophy. A candidate for the PhD degree must master the general areas of entomology (control, ecology, genetics, morphology, physiology, and taxonomy) and demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research is also required. The grade-point average required for degree certification is 4.0.

Financial Aid. Awards for graduate students are available, including teaching and research assistantships. In addition, various types of fellowships, traineeships, and tuition and service fee waivers are offered by the Graduate College and the School of Life Sciences. A single application to the department is sufficient for consideration for all awards currently available.

Genetics and Development

This program will be discontinued. Students in the program as of fall 1987 may continue, but students have not been admitted to the program after fall 1987. Students interested in genetics and development should consult the Life Sciences Office (393 Morrill Hall) for advice on which program would be most appropriate to their individual interests. Study in genetics continues to be available through the various departments in the life sciences.

Microbiology

Acting Head of the Department: Ralph S. Wolfe
Correspondence and Information: Department of Microbiology, University of Illinois at Urbana-Champaign, 131 Burrill Hall, 407 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.P. Bryant, J.E. Cronan, S.K. Farrand, J. Konisky, M.J. Plewa, M.E. Reichmann, A.A. Salyers, R.W. Tuveson, E.W. Voss, C.R. Woese, R.S. Wolfe
Associate Professors: J.F. Gardner, S.J. Kaufman, S.G. Lazarowitz
Assistant Professors: V.A. Bankaitis, S.R. Maloy, G.J. Olsen, D.A. Stahl

Graduate Degree Programs. The Department of Microbiology offers graduate work leading to the master of science and doctor of philosophy degrees. For both degrees, the program provides a strong basic background in microbiology, biochemistry, cell biology, molecular genetics, and molecular biology. Students completing the program are qualified for positions in academic, industrial, or government laboratories and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Major areas of research interest are gene expression and regulation in prokaryotes and eukaryotes, viral function and development including virus host-cell interactions, membrane biogenesis including protein insertion, fatty acid and phospholipid synthesis, bacterial pathogenesis and bacterial-host interactions, immunoglobulin chemistry, structure and expression, anaerobic microbiology, the biochemistry of methane formation and microbial physiology, the cell biology and biochemistry of development and differentiation of muscle tissue, yeast cell and molecular biology, prokaryote phylogeny and evolution, and archaebacteria.

Admission. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through organic chemistry and biochemistry, 15 credit hours of physical or biological sciences, and mathematics through calculus.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees, following their choice of a faculty mentor. Study programs are flexible and are dependent upon the experience, interests, and goals of each student. Experience in teaching is considered to be a vital part of the graduate program and is required as a part of the academic work of all MS and PhD degree candidates in this department.

Physiology and Biophysics

Head of the Department: J.E. Zehr

Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, 407 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.M. Bahr, L. Barr, P.J. Bechtel, D.E. Buetow, A.R. Crofts, P.B. Debrunner, A.L. DeVries, E. Donchin, H.S. Ducoff, F. Dunn, T.G. Ebrey, A.S. Feng, H. Frauenfelder, R.B. Gennis, Govindjee, W.T. Greenough, J.E. Heath, S.I. Helman, G.L. Jackson, B.S. Katzenellenbogen, B.W. Kemper, R.A. Nelson, C.L. Prosser, V.D. Ramirez, E. Satinoff, O.D. Sherwood, I.A. Siegel, W.W. Sleator, H.M. Swartz, A.R. Twardock, G. Weber, J.S. Willis, C.A. Wraight, J.E. Zehr

Associate Professors: P.M. Best, M.J. Dawson, F. Delcomyn, R. Gillette, E. Gratton, M. Holzwarth, E.G. Jakobsson, A. Kokko-Cunningham, E. Meisami, B. Oakley, E.J. Roy, D.C. Sweeney, T.G. Waldrop

PHYSIOLOGY

Admission and Financial Aid. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a strong undergraduate training in science. The Graduate College admission requirements apply. Most students admitted have had a grade-point average between an A and B and letters of recommendation that indicate ability to perform graduate work. Fellowships and teaching or research assistantships are available for qualified students. Applicants are strongly urged to submit scores of the Graduate Record Examination (GRE) or similar examinations.

Master of Science. A master's degree requires 8 or more units of graduate work drawn from the offerings of this and other departments. Each student must submit, and pass an oral examination on, a report based on original research. The examination is conducted by a faculty qualifying committee.

Doctor of Philosophy. Every candidate for the PhD degree is required to take three core lecture courses and four laboratory courses, the latter of five weeks duration each, in order to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology. Each student also is expected to acquire a high degree of expertise in an area of specialization and to develop proficiency in biochemistry, physical chemistry, and statistics. The student should begin research as soon as possible after admission. To qualify to continue

in the PhD program, students must submit, and pass an oral examination on, a report describing their initial research. The examination is conducted by a faculty qualifying committee usually during the fourth semester after admission to the graduate program.

The preliminary examination is taken after completion of at least 16 units of graduate course work, after completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. Defense of a thesis, which is based on original work and which demonstrates thorough knowledge of theory and techniques in one of the branches of physiology, constitutes the final examination.

BIOPHYSICS

Admission and Financial Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical sciences to the solution of biological problems. The curriculum is broadly based, and provides an adaptable approach for students entering with previous training in the physical sciences or for students with a background in biology and some experience in the physical sciences. Admission requirements are usually one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through calculus, but deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0 (A = 5.0). Fellowship, traineeships, and teaching or research assistantships are available for qualified students. Usually, students are expected to obtain at least one semester of teaching experience during their graduate careers.

Master of Science. To obtain the master of science degree, the student must complete at least 8 units in biophysics and related subjects, including 3 units at the 400 level, of which 2 units must be in biophysics courses (excluding individual topic courses, seminars, and research). A thesis or research paper in a specialized field is also required.

Doctor of Philosophy. The program has a flexible approach toward curriculum requirements, but an acceptable course program usually includes the following: (1) Physical sciences: mathematics through differential equations, physics and physical chemistry including thermodynamics and elementary quantum mechanics, and biochemistry with laboratory. (2) Biophysics: satisfactory completion of 3½ units of 400-level biophysics courses (excluding individual topic courses, seminars, and research). Other subjects may be taken with the approval of faculty. (3) Research experience as soon as practicable after admission. The PhD degree is a research degree, and the program is designed with a major emphasis on individual research.

A pass-fail qualifying examination is usually taken during or before the fourth semester. After the student has formulated a definite research problem, he takes the preliminary examination in which this topic is presented to a faculty committee. The committee also will question the candidate on his general research area. Finally, a thesis, which is based on original work and which demonstrates a thorough knowledge of theory and techniques in one of the areas of biophysics, must be defended at the final examination.

Plant Biology

Head of the Department: David S. Siegler

Correspondence and Information: Associate Head, Department of Plant Biology, University of Illinois at Urbana-Champaign, 289 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.E. Buetow, Z.B. Carothers, R.E. Crang, D.B. Dickinson, Govindjee, L.R. Hoffman, J.R. Laughnan, W.L. Ogren, D.R. Ort, T.L. Phillips, D.S. Seigler, C.A. Shearer, R.W. Tuveson, C.A. Wraight

Associate Professors: C.K. Augspurger, J.M. Cheeseman, A.G. Jones, M.L. Sargent, M.A. Schuler, C.J. Whitmarsh

Assistant Professors: D.R. Bush, E.H. DeLucia, T.W. Jacobs, D.L. Nickrent, R.E. Zielinski
Affiliates: L.I. Nevling, K.R. Robertson
Adjunct Professor: J.A.D. Parrish

Graduate Degree Programs. The Department of Plant Biology offers graduate work leading to the master of science and doctor of philosophy degrees. It also participates in interdepartmental study programs leading to doctoral degrees in plant physiology.

Areas of specialization available within the department include: anatomy, bioenergetics, biophysics, bryology, circadian rhythms, development, ecology, genetics/molecular biology, mycology, paleobotany, paleoecology, photosynthesis, phycology, physiology, phytochemistry, population biology, systematics, and ultrastructure. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization. A knowledge of the principles of ecology, genetics/molecular biology, morphology, physiology, and systematics is strongly recommended.

A brochure providing additional information about the department, its facilities, and the research interests of its faculty is available from the associate head upon request.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required. Graduate College admission requirements also apply.

Master of Science. Candidates for the MS degree are expected to fulfill the requirements of the Graduate College and to broaden and deepen their training in a program of course work and research agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser. The master's degree program is usually completed within two years.

Doctor of Philosophy. Candidates for the PhD are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

An evaluation of each student's academic progress will be made at the end of his or her second year of graduate study, and departmental approval must be obtained at this juncture in order to continue in a graduate degree program.

Financial Aid. Teaching assistantships, fellowships, and research assistantships are available for qualified students. A student who is awarded a fellowship may apply to have his or her stipend augmented with a part-time teaching or research assistantship.

Outstanding Facilities. Outstanding teaching and research laboratories encompass both molecular and organismal plant biology and are complemented by growth-chamber facilities, environmentally controlled greenhouses, an excellent herbarium, and a paleobotanical center for collections.

LINGUISTICS

(Including African Languages, Arabic, Modern and Classical Hebrew, Hindi, Persian, and Sanskrit)

Acting Head of the Department: Charles W. Kisseberth
Correspondence and Information: Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, D.E. Baron, W.C. Blaylock, C.C. Cheng, P. Cole, C.L. Dawson, P.A. Gaemg, G.M. Greene, H.H. Hock, B.B. Kachru, Y. Kachru, M.J. Kenstowicz, C.-W. Kim, C.W. Kisseberth, C. Kramarae, F.K. Lehman, H. Maclay, S. Makino, J.W. Marchand, G.L. Tikku, L. Zgusta

Associate Professors: E.G. Bokamba, I.F. Bouton, J.R. Cowan, W.B. Dickerson, R. Dunatov, F.Y. Gladney, F.M. Jenkins, J.L. Morgan
Assistant Professors: E. Hinrichs, J.I. Hualde, M. Mack, R. Pandharipande
Emeritus Professors: K.O. Aston, H.R. Kahane

Graduate Degree Programs. The Department of Linguistics offers graduate programs leading to the master of arts and doctor of philosophy degrees. Work toward these degrees is divided into two major areas. General linguistics includes historical linguistics, phonology, semantics, and syntax. Applied linguistics covers experimental phonetics, language acquisition, lexicography, psycholinguistics, sociolinguistics, and stylistics. Other areas of concentration are artificial intelligence, cognitive science, and computational linguistics, as well as area linguistics (with concentration in African, Romance, Semitic, and South, West, or East Asian linguistics). Work in these areas may be done under general or applied linguistics.

Admission and Advising. Undergraduate preparation for the study of linguistics at the graduate level should include the study of at least one foreign language; courses equivalent to Linguistics 300, 301, and 302 at this University; and a broad background in the humanities, social sciences, and mathematics. The Graduate College admission requirements apply.

The head of the department acts as adviser for new students. As students progress in their studies, they select their own adviser according to their individual needs and interests.

Master of Arts in General or Applied Linguistics. The aim of the master's program is to instruct students in the major areas of linguistic theory and the methods of linguistic analysis. Candidates for this degree must earn at least 8 units with a minimum grade-point average of 4.0 (A = 5.0), and satisfy other department and Graduate College requirements. Those concentrating on the general program are required to take Linguistics 340, 401, 402, 411, 441, and 442. The applied program requires Linguistics 305, 325, 340, 350, 401, 402. Electives may not contain more than 1 unit of Linguistics 490. In addition, students must have proficiency in one language (other than their native tongue) in which there exists a significant body of linguistic literature and must pass the qualifying examination. Instead of taking the examination, students wishing to obtain a terminal MA degree may write an acceptable MA thesis under Linguistics 490, for 1 unit in addition to the 8-unit course requirement (for a total of 9 units).

Doctor of Philosophy in General or Applied Linguistics. Admission to candidacy for the PhD requires a grade-point average of 4.5 or better for all graduate work in linguistics, distinction in passing the qualifying examination, achieving a grade of B or better in each of two courses in an approved sequence not covered by the qualifying exam, and submitting an acceptable original research paper that meets professional standards. In deciding whether students will be admitted to the PhD program, the examination and student evaluation committee considers their performance in meeting these requirements, as well as their general potential for doing advanced linguistic research.

Candidates for the PhD degree must complete at least 24 units of graduate work, or 16 units beyond the master's degree. The minimum 24 units must include the course requirements listed above for the master's degree (or their equivalent), advanced courses as required for the area of specialization, and 8 units of thesis research. Candidates must also demonstrate proficiency in a language that is neither their native tongue nor the same language as that used to satisfy the first foreign language requirement. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to 2 units of credit granted under this program may be transferred. Candidates are required to take the preliminary examinations (written and oral) after completion of 8 units beyond the master's level, and to present a talk at a meeting of the Linguistics Seminar. Before presenting their final dissertation defense, students are required to demonstrate familiarity with a non-Western language to insure familiarity with the linguistic structure of a language substantially different from those routinely discussed in required courses.

MATERIALS SCIENCE AND ENGINEERING

Head of the Department: J. Economy
Correspondence and Information: Head, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, 1304 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.J. Altstetter, R.S. Averback, R.L. Berger, H.K. Birnbaum, S.D. Brown, R.C. Buchanan, H. Chen, S. Danyluk, J. Economy, G. Erlich, R.J. Gaylord, P.H. Geil, J.E. Greene, K. Kim, F.V. Lawrence, J. Mazumder, D.A. Payne, T.J. Rowland, S.I. Stupp, C.M. Wayman, R.P. Wool, J.F. Young
Associate Professors: W.M. Kriven, J.M. Rigsbee, I. Robertson, G.P. Wirtz, A. Zangvil
Assistant Professors: J. Abelson, J. Adams, S. Granick, J. Homeny, J. Kieffer, T.A. Parthasarathy, A. Rockett
Adjunct Professors: R. Benedek, M. Berg, S. Bhagwat, H.L.Fraser, A. Kumar
Emeritus Professors: P.A. Beck, C. Bergeron, R.W. Bohl, R. Cook, E. Eckel, J. Nelson, F. Tooley, C.A. Wert, W. Williams, T. Willmore

Graduate Degree Programs. The Department of Materials Science and Engineering offers graduate work leading to the master of science and doctor of philosophy degrees. The student body and the faculty have widely varied backgrounds in science and engineering. Faculty members are carrying out research in many different areas, and students may choose to specialize in various aspects of materials science and engineering, including ceramics, metals, polymers, and electronic materials.

Admission. Graduate students have undergraduate degrees in a number of scientific and engineering disciplines. Admission to graduate study is based on undergraduate performance and letters of reference. International students are expected to be proficient in English.

Master of Science. A candidate for the master of science must complete a minimum of 8 units of graduate work, including a thesis. A 9-unit, nonthesis degree is also available for students who do not hold a research assistantship. Course work includes graduate courses in the student's area of concentration (e.g., metals, polymers, ceramics, or electronic materials) as well as in other areas of materials science and engineering.

Doctor of Philosophy. The PhD degree requires, in addition to the requirements for the MS degree, 6 units of course work, including courses on the statistical thermodynamics of materials and the kinetic processes in materials, and 10 units of thesis credit. Course work will include graduate courses in the student's area of concentration, in other materials areas, and in other subjects in science and engineering. Students must pass the written departmental qualifying examinations covering the subjects of classical and statistical thermodynamics and kinetics, as well as meet additional requirements in the student's area of concentration. A preliminary examination covering the student's thesis research is also required. This examination consists of a brief written research proposal and an oral presentation by the student to a committee of faculty members. This committee will be available for consultation with the student throughout the course of thesis research and will then serve on the student's PhD final examination committee.

Financial Aid. Graduate students may be supported by research assistantships, fellowships, teaching assistantships, and waivers of tuition and service fees.

MATHEMATICS

Chair of the Department: C. Ward Henson
Director of Graduate Studies: Wilson Zaring
Correspondence and Information: Director of Graduate Studies, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, 1409 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: F.R. Albrecht, J.R. Alexander, Jr., K.I. Appel, R.B. Ash, S.B. Bank, R.G. Bartle, H.E. Benzinger, Jr., I.D. Berg, E.R. Berkson, B.C. Berndt, R.L. Bishop, J. Bourgain, P.G. Braunfeld, D.L. Burkholder, R.W. Carroll, R.F. Craggs, E.C. Dade, J.P. D'Angelo, H.G. Diamond, E.G. Evans, Jr., R.M. Fossum, G.K. Francis, C.W. Gear, S.I. Goldberg, J.W. Gray, D.R. Grayson, P.A. Griffith, W.J. Haboush, W.R.G. Haken, H. Halberstam, M.E. Hamstrom, S.P. Han, L.L. Helms, C.W. Henson, G.J. Janusz, R.P. Jerrard, C.G. Jockusch, F.W. Kamber, R.P. Kaufman, F.B. Knight, R.G. Langebartel, P.A. Loeb, H.P. Lotz, L.R. McCulloh, L. McLinden, J.B. Miles, D.E. Muller, H.A. Osborn, J.I. Palmore, N.T. Peck, A.L. Peressini, W.V. Philipp, H.A. Porta, R.R. Rao, B.A. Reznick, D.J.S. Robinson, J.J. Rotman, L.A. Rubel, P.E. Schupp, K.B. Stolarsky, W.F. Stout, M. Suzuki, G. Takeuti, T.W. Ting, P.M. Tondeur, J.J. Uhl, Jr., S.V. Ullom, L. Van den Dries, J.H. Walter, P.M. Weichsel, J.E. Wetzel, S. Wolfram, J.M. Wu

Associate Professors: S.B. Alexander, P. Aviles, A. Babakhanian, J.W. Brown, L.L. Dornhoff, S. Dutta, A. Hildebrand, D. Monrad, R.G. Muncaster, H. Paley, E.G. Portnoy, D.R. Sherbert, E.C. Weinberg, D.B. West, W.M. Zaring

Assistant Professors: M. Bergvelt, E.W. Gray, P.K. Newton, M. Nicolau, I.M. Reiner, Z. Ruan

Graduate Degree Programs. The department offers graduate study leading to the Master of Science (or of Arts) in Mathematics, the Doctor of Philosophy in Mathematics, the Master of Science in Applied Mathematics, and the Master of Science in the Teaching of Mathematics. An advanced certificate in community college mathematics teaching is also available.

Admission. The Graduate College admission requirements apply. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics and a grade-point average of 4.25 (A = 5.0). Students whose undergraduate training in mathematics is deficient may be admitted with deficiencies to be removed during the first year of graduate study.

Master's Degree Program. The master's degree programs can be completed in one to one-and-a-half years of full-time study by students entering without deficiencies. Students entering with deficiencies may require up to two years to complete the degree. There are no thesis or language requirements, and no comprehensive examination is required.

The master's degree in mathematics requires a total of 8 units of study, of which 3 must be at the 400 level, and 2 of the 3 must be in mathematics. The master's degree in applied mathematics requires a total of 8 units of study of which 3 must be at the 400 level. Additional course and sequence requirements can be satisfied through study in one of three different programs: (1) the mathematics of computation, optimization, and operations research program, (2) the science applications program, or (3) the actuarial science program.

The master's in the teaching of mathematics requires a total of 8 units of study, of which 4 must be in mathematics and 2 must be in education.

The advanced certificate in community college mathematics teaching is designed to be completed in two semesters following completion of a master's degree in mathematics. The program involves student teaching and specialized course work.

Doctoral Degree Program. Students working toward a doctoral degree usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses in abstract and linear algebra and real and complex analysis), pass the preliminary examination (testing the content of three areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. A reading knowledge of two of the following languages is required: German, English, French, or Russian, excluding the student's native language.

Financial Aid. Financial aid is available in the form of teaching assistantships, fellowships, tuition waivers, and partial service-fee waivers. The deadline for submission of complete fellowship applications is February 15. The initial deadline for submission of complete assistantship applications is also February 15, but applications are considered after that as long as positions remain available.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: A.L. Addy
Associate Heads of the Department: A.M. Clausing and R.E. DeVor
Graduate Policy Committee Cochairs: R.E. DeVor and J.C. Dutton
Correspondence and Information: Celia G. Snyder, Graduate Programs Coordinator, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, 140 Mechanical Engineering Building, 1206 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: A.L. Addy, R.J. Adrian, R.O. Buckius, J.C. Chato, M.M. Chen, A.M. Clausing, T.F. Conry, C. Cusano, R.E. DeVor, J.E. Greene, B.G. Jones, K. Kim, H. Krier, J.S. Liebman, J. Mazumder, N.P. Moray, C.O. Pedersen, D.F. Socie, S.L. Soo, W.F. Stoecker, J.J. Stukel, C.L. Tucker III, J.S. Walker, R.A. White, C.D. Wickens, K-H.A. Winkler
Associate Professors: R.A. Beddini, M.Q. Brewster, C.W. Bullard, R.L. Burton, J.A. Dantzig, M.I. Dessouky, W.E. Dunn, S.G. Kapoor, R.E. Klein, A.F. Kramer, C.S. Larson, K.D. Lee, S.C-Y. Lu, D.L. Marriott, N.R. Miller, T.A. Newell, D.H. Offner, A.J. Pearlstein, J.E. Peters, L.D. Savage, H. Sehitoglu, J.F. Stubbins, S.P. Vanka, L. Wozniak
Assistant Professors: D.N. Assanis, J. Bentsman, R.R. Crawford, P.M. Ferreira, J.M. Flach, P. Hsu, U.S. Palekar, J.P. Renie, P.M. Sanderson, B.G. Thomas, D.L. Thurston, T-C. Tsao, H.A. Zaki

Graduate Degree Programs. The Department of Mechanical and Industrial Engineering offers studies leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, and the Doctor of Philosophy in Mechanical Engineering. Details outlining specific degree requirements are included in brochures available through the Department of Mechanical and Industrial Engineering.

Research Areas. Research in the Department of Mechanical and Industrial Engineering is broadly based, following the traditional disciplines of mechanical engineering and industrial engineering on the one hand and encompassing areas that are at the cutting edge of the profession on the other. The activities reflect not only the interests and creativity of our faculty and students, but also their responsiveness to societal problems. While the generation of new knowledge remains a basic function, a number of ongoing research projects have been prompted by the current needs of the state of Illinois and of the nation. A significant portion of the research effort concerns the production, conversion, use, and conservation of energy and the environmental impact of such practices. Current areas of research include automotive systems engineering; bioengineering; combustion and propulsion; control systems; energy systems and environmental engineering; fluid mechanics and gas dynamics; heat, mass, and momentum transfer; human factors and man-machine systems; manufacturing engineering and integrated quality systems; materials engineering; materials processing; mechanical design and design methodology; lubrication and wear; multiphase mechanics and multiphase flow systems; nuclear power engineering; operations research; production management; robotics; solar energy; and thermal systems. New areas of research are laser-aided materials processing, polymer processing, computer-aided design and manufacturing, knowledge-based expert systems, and artificial intelligence.

The department has a strong commitment to interdisciplinary research and works closely with other departments: aeronautical and astronautical engineering in the fields of aerodynamics and combustion; agricultural engineering in petroleum and nonpetroleum fuels; electrical and computer engineering in fuel spray combustion and in electrohydrodynamic pumping; materials science and engineering in materials properties and processing; and psychology in ergonomics and human factors engineering. Cooperation with the bioengineering faculty, the Coordinated Science Laboratory, and the Materials Research Laboratory also lends diversity to the department's research. The department also has strong involvement in several research center activities including the Manufacturing Research Center, the Air Conditioning and Refrigeration Center, and the Institute for Competitive Manufacturing. Faculty and students are also involved in the campus Beckman Institute for Science and Technology and the National Center for Supercomputing Applications.

Admission. An applicant for admission to the Department of Mechanical and Industrial Engineering must (1) be a graduate of an institution awarding a baccalaureate degree equivalent to that granted by the University of Illinois at Urbana-Champaign; (2) be adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record; and (3) be recommended for admission by the Department of Mechanical and Industrial Engineering. A minimum grade-point average of 4.25 (A = 5.0) for the last 60 hours of undergraduate study is required. On rare occasions, the department may recommend an applicant for admission with limited standing even if the admission grade-point average is below the required minimum. Scores on the Graduate Record Examination general test are required of all applicants from non-U.S. colleges and universities and are strongly recommended for all other applicants. There is no language requirement. The department requires a minimum TOEFL score of 590 for those applicants who have not completed at least two years at a U.S. institution. Based upon the previous preparation of the student, prerequisite courses may be specified by the adviser, but the credit may not be applied toward a degree.

Master of Science. A total of 8 units (including no more than 2 units of thesis credit) is required. For those students terminating their studies with the MS degree, a nonthesis option is available by departmental petition. Those pursuing the nonthesis option are required to complete a minimum of 9 units of credit. In such cases, the study program includes 1 unit of independent laboratory investigation since each student is required to show evidence of the ability to do independent study.

Doctor of Philosophy. A master's thesis is required of all applicants for PhD study. Those students who enter with a master's degree and who have not written a thesis or the equivalent must demonstrate, through previous work or through registration in an independent laboratory-investigations course, that they are capable of carrying out independent research. Qualifying examinations are to be taken during the semester in which the ninth unit of graduate credit is earned, at the earliest, but no later than the first semester thereafter. A total of 14 units of course work (including the course work taken at the MS level) beyond the BS degree is the minimum course work requirement for the PhD degree. The minimum total requirement for the PhD degree is 24 units, including thesis research credit. The preliminary examination is taken upon completion of all required course work for the PhD degree or in the semester in which the final course work is taken, but no sooner. The preliminary examination for the doctoral degree should be completed not later than two years after the student completes Stage 1 (master of science degree or equivalent) of the doctoral program. A minimum of six months should elapse between the successful completion of the doctoral preliminary examination and the doctoral final examination. Upon satisfactory completion of the preliminary examination, the candidate completes the research phase (including the thesis) and takes a final oral thesis defense examination.

Financial Aid. Financial assistance, available on a competitive basis, includes fellowships, assistantships, and waivers of tuition and fees. Assistantship stipends vary with one's entry level into the program.

MEDICAL SCHOLARS PROGRAM

The Medical Scholars Program at the Urbana-Champaign campus enables students to combine the study of medicine with graduate or professional study in a second field. The program seeks to produce leaders in medicine and medical research uniquely qualified and motivated to address the compelling problems of health care and medical practice. The College of Medicine at Urbana-Champaign, one of four regional campuses of the University of Illinois College of Medicine, offers the program in cooperation with graduate departments and professional schools on the Urbana-Champaign campus.

Students are expected to earn two degrees—the MD and a graduate or professional degree. Applicants should be able to identify research interests and professional goals that demand the integration of medicine with a second field and that cannot be accomplished with one degree alone. To enter the Medical Scholars Program, applicants must meet the

admission requirements of, and be accepted by, both the University of Illinois College of Medicine and the Urbana-Champaign campus academic unit in which they wish to study. They apply to the Medical Scholars Program at the same time that they apply to medical school.

Students in the Medical Scholars Program are expected to fulfill all the requirements of both the College of Medicine and the second discipline. Faculty advisers from the medical school and from the appropriate Urbana-Champaign campus unit help students set up realistic long-term study plans that integrate the two fields.

At present, research-oriented programs of integrated study are available or are being developed in the following academic units on the Urbana-Champaign campus:

Accountancy
Anthropology
Architecture
Biochemistry
Biophysics
Business Administration
Cell and Structural Biology
Chemical Engineering
Chemistry
Civil Engineering
Communications Research
Computer Science
Ecology, Ethology, and Evolution
Economics
Education
Electrical and Computer Engineering
English
Entomology
Environmental Toxicology
Finance
Food Science
Health and Safety Studies
History
Kinesiology
Law
Materials Science and Engineering
Mathematics
Mechanical and Industrial Engineering
Microbiology
Neural and Behavioral Biology
Nuclear Engineering
Nutritional Sciences
Philosophy
Physics
Physiology
Political Science
Psychology
Slavic Languages and Literatures
Social Work
Sociology
Speech and Hearing Science
Speech Communication
Statistics
Veterinary Biosciences
Veterinary Pathobiology

Arrangements with graduate units not listed here may be worked out, wherever possible, upon request.

In addition to the Medical College Admissions Test (MCAT) required for admission to medical school, examination scores such as those for the GRE, GMAT, and LSAT are required by some departments and professional schools. Applicants must arrange to take such examinations and have the scores forwarded to the appropriate academic unit on the Urbana-Champaign campus as well as to the Medical Scholars Program Office.

For further information, consult the Coordinator, Medical Scholars Program, College of Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801.

MUSIC

(Including Music Education and Musicology)

Director of the School: Don V Moses

Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, 2136 Music Building, 1114 West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Boardman, H. Brun, E. Dalheim, K. Drake, B. Edlefsen, M. Elyn, T. Fredrickson, R. Gray, L. Gushee, R. Hedlund, W. Heiles, J. Hill, I. Hobson, M. Hoffman, J. Keene, H. Kellman, J. Lyke, S. Martirano, J. Melby, B. Nettl, G. Perich, D. Peters, M. Powell, A.

Ringer, J. Shapiro, T. Siwe, N. Temperley, P. Vermel, W. Warfield, T. Wisniewski, M. Zimmerman, P. Zonn

Associate Professors: C. Alwes, J. Beauchamp, C. Capwell, J. Grant, D. Grayson, H. Klug, D. Kohut, S. Tipei, H. von Gunden, T. Ward, S. Wyatt

Graduate Degree Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education. Complete details of these programs may be found in the school's brochure on graduate study in music.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the MMus degree are musicology, music theory, composition, performance and literature (piano, organ, voice, orchestral instruments), choral music, instrumental conducting, vocal accompanying and coaching, and group piano pedagogy.

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution (students holding other degrees may be admitted but will be expected to make up any deficiencies). Those majoring in musicology are generally expected to have a minimum grade-point average of 4.25 (A = 5.0). Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings. Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each at the college level or two years at the high school level of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students who are otherwise admissible may satisfy any language deficiencies concurrently with graduate studies.

Degree Requirements. Candidates for the MMus degree in theory-composition and in performance and literature must earn at least 8 units, including 2 units at the 400 level in their major field and 1 unit in problems and methods. Candidates in performance and literature must earn 2 units in the music literature course in their major applied area. Candidates in musicology must earn 2 units in introduction to musicology and 2 units in the seminar in musicology. Electives in music theory, history and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate adviser. Each candidate for the MMus must participate in an ensemble during two of the terms of study. A graduate recital is required of all candidates in performance and literature. Candidates in musicology and theory must write a thesis, for which 2 units of credit are given. Candidates in composition must present a portfolio of their works for approval by the composition faculty.

Doctor of Musical Arts. The fields of specialization for the DMA degree are composition, piano, organ, choral music, voice, violin, viola, cello, wind instruments, and percussion instruments.

Admission. Prerequisites for admission are the following: (1) The MMus degree from the University of Illinois at Urbana-Champaign, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review, and candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble performance and/or score reading. (4) The successful completion of approximately 32 semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of 6 hours in history and 6 hours in literature and philosophy; candidates in voice must have fulfilled all foreign language requirements considered prerequisites for the MMus degree.

Degree Requirements. Candidates must earn a minimum of 16 units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of 3 units in the major field of specialization, 2 units in advanced music literature courses, and 2 units in a minor field. A preliminary examination is taken once all course work is completed.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester, 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition and of performance and literature, 6 units are devoted to a special doctoral project. Composers must produce a large-scale original score. Performers must demonstrate comprehensive repertory study in the form of two solo recitals or one solo recital and two of the following options: performing a concerto, a major operatic or oratorio role, or a chamber music program; giving a lecture-recital; or preparing and, when appropriate, conducting a concert by an instrumental or vocal ensemble. In addition, both fields have a research requirement that serves in lieu of a thesis. In the field of choral music, 1 unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory, and 4 units are devoted to the writing of a thesis.

Doctor of Philosophy in Musicology. The PhD in musicology is intended for those whose interests lie in research in the history of music, systematic musicology, or ethnomusicology.

Admission. Prerequisites for admission are (1) The MMus degree in musicology from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution. (2) A minimum of 32 semester hours in the liberal arts and sciences, usually including general history, philosophy, and literature.

Degree Requirements. A minimum of 16 units must be earned beyond the requirements for the master's degree, including at least 2 units in the seminar in musicology. Although no formal outside minor is required, students are expected to take courses in fields outside music that are appropriate to the proposed area of thesis research. A preliminary examination is taken after all course work is completed.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester, 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Usually, 8 of the total of 16 units are devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 4.0. Candidates for this degree must earn a minimum of 4 units in music courses, 2 units in education courses, and 2 units of electives. One of the 4 units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in their major performing medium during the registration period of their first term in residence. Each candidate for the MS must participate in an ensemble during two of the terms of study. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. During the student's first registration period, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of 8 units beyond the master's degree is required, including 1 unit in music education courses and 1 unit in educational psychology.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music, music education, or a related academic discipline acceptable to the Graduate Committee for Music Education. Admission is determined by examinations in music history, music theory, music education, and applied music; personal interviews; records of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies Test should accompany his or her application for admission.

Program. At least 16 units of work beyond the master's degree are required, including 6 units in music courses and 6 units in education courses. No more than 2 units of credit in applied music may be counted toward the degree. A thesis is required; it may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled either by full-time study in two consecutive semesters or by full-time study in one semester, a contiguous summer session, and one additional summer session.

Financial Aid. Fellowships, teaching and research assistantships, and tuition and service fee waivers are awarded on a one-year basis with continuation dependent upon success in the program. Specific information on application procedures is available from the Graduate Office, School of Music.

NUCLEAR ENGINEERING

Head of the Department: Barclay G. Jones
Correspondence and Information: Department of Nuclear Engineering, University of Illinois at Urbana-Champaign, 214 Nuclear Engineering Laboratory, 103 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.A. Axford, D.F. Hang, B.G. Jones, K. Kim, G.H. Miley, R.J. Turnbull
Associate Professors: M. Ragheb, D.N. Ruzic, C.E. Singer, J.F. Stubbins, J.G. Williams
Assistant Professors: W.H. Choe, S. Landsberger, A.M. Ougouag

Graduate Degree Programs. The Department of Nuclear Engineering offers work leading to the master of science and doctor of philosophy degrees.

Admission. Application for admission to the MS and PhD programs is open to all graduates in engineering, mathematics, and the physical sciences with an average grade of B or better for the last 60 hours of undergraduate work and any graduate work completed. Prerequisites for admission include a course in ordinary differential equations plus one other mathematics course beyond calculus; an intermediate course in atomic physics; a course in electrical circuit theory; a course in thermodynamics; and a course in fluid mechanics or a course in continuum mechanics. A student may be admitted before completion of these prerequisites, but he or she must allow additional time for making up these deficiencies; courses taken to make up such deficiencies will not count toward the number of units required for the degree. Transcripts are required; letters of recommendation and information such as undergraduate class rank are recommended. International students must demonstrate proficiency in English, as measured by the TOEFL and SPEAK (Speaking Proficiency English Assessment Kit) tests,

with minimum scores of 550 and 230 respectively. They may be required to take courses in English as a second language.

Master of Science. The MS degree will usually take at least two semesters and a summer session to complete; 8 units of graduate work are required, including an MS thesis. The curriculum requires courses covering the fundamentals of nuclear engineering, plus two or more courses in an area of concentration chosen by the student in consultation with his or her adviser. Typical areas include nuclear materials, fusion systems and plasma engineering, energy conversion, radiation protection engineering, reactor physics and radiation transport, reactor thermal analysis and design, and reactor safety and nuclear power economics. At least 6 units of credit must be in nuclear engineering.

Doctor of Philosophy. Course requirements for the PhD degree include at least 8 units of course credit beyond that required for the MS degree. After this period, one or more years may be needed for the doctoral research and thesis. Students desiring to work toward the PhD degree must pass the qualifying examination to be admitted to doctoral study. The doctoral candidate must complete course work, pass a preliminary doctoral examination, write a doctoral thesis, and successfully defend the thesis at the time of the final examination. A doctoral student would typically complete about twelve courses in nuclear engineering plus additional courses that support a specialized research area and provide background in mathematics and science. There is no foreign language requirement. Under exceptional circumstances, the doctoral research may be undertaken off campus.

Financial Aid. Fellowships and traineeships are generally available to support the best applicants. Other aid in the form of research assistantships and teaching assistantships is available for most other graduate students. Other work of a professional nature can sometimes be found in the University or surrounding community. If the number of students is more than the department can assist financially, the support is distributed according to academic merit.

Research Interests. Faculty research interests cover a wide range including, but not limited to, reactor physics and engineering, radiation measurements, fusion and plasmas, nuclear thermal-hydraulics, nuclear safety, nuclear bioengineering, radiation-transport phenomena, nuclear materials, and neutron activation.

Facilities. A nuclear reactor, a supercomputer, a dense plasma focus device, and many other major research resources are available for nuclear engineering research. The versatile Illinois Advanced Triga reactor operates at 1.5 megawatts steady state and pulses to 6,000 megawatts peak power. A low-power reactor facility, adjacent to the Triga, provides unique coupled-core experimental capabilities. A dense plasma focus fusion-related device for high-temperature plasma studies and an ultrahigh-vacuum laboratory for plasma-material interaction studies are available. The College of Engineering's Materials Research Laboratory and Materials Engineering-Mechanical Behavior program provide a variety of facilities for studies of nuclear materials. Other laboratories are also available for environmental studies and nuclear spectroscopy; health physics and radiation studies; nuclear waste management; thermal hydraulics and reactor safety; reactor physics and reactor kinetics; controlled nuclear fusion; direct energy conversion; and lasers and plasma physics. The College of Engineering is a leader in supercomputer research, and the campus is one of four National Centers for Supercomputing Applications. The Department of Nuclear Engineering also has a direct link to the National Magnetic Fusion Computer Center in Livermore, California. In addition, microcomputers are available for students' use and are integrated into laboratory courses.

NUTRITIONAL SCIENCES

Interim Director of the Division: John W. Erdman, Jr.

Correspondence and Information: Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, 451 Bevier Hall, 905 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.H. Baker, P.J. Bechtel, L.A. Birch, R.A. Boileau, J.H. Clark, R.A. Easter, J.W. Erdman, Jr., G.C. Fahey, Jr., K.E. Kelley, B.P. Klein, B.L. Larson, D.K. Layman, R.A. Nelson, T. Nishida, W.D. O'Brien, E.G. Perkins, J.L. Robinson, A.J. Siedler, H.M. Swartz, W.J. Visek, J.S. Willis

Associate Professors: B.H. Cho, A.S. Hassan, T.F. Hatch, A.K. Hatfield, R.L. Magin, M.R. Murphy, J.E. Novakofski, A.A. Salyers

Assistant Professors: R.E. Burr, K.M. Chapman, G. Czarnecki-Maulden, R.H. Deering, E.H. Jeffery, L.L. Ji, J.A. Kaput, A. Katz, S.J. Schmidt, K.W. Singletary, M.A. Wallig, M.M. Weigel

Emeritus Professors: C.L. Davis, R.M. Forbes, E. Sleator

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science in Nutritional Sciences and the Doctor of Philosophy in Nutritional Sciences is offered. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes; animals, including man; nutritional biochemistry; and the chemistry of nutritional compounds and nutrition education. The program offers the opportunity for pursuing both the MD and PhD degrees in the Medical Scholars Program.

Admission and Financial Aid. Applicants are expected to have an admission grade-point average of 4.0 (A = 5.0) for the last 60 hours of course work and basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of traineeships, assistantships, and fellowships. Applicants seeking August admission and expecting to be considered for financial assistance should file their applications before the preceding February 15th. Later applications will be considered depending on the space and support available.

Master of Science. Requirements for the MS include courses in general biochemistry, two courses in advanced nutrition, and one semester of seminar. Additional courses are available in such diverse subjects as human and animal nutrition, biochemistry, physiology, immunology, food science, education, anthropology, psychology, sociology, statistics, and/or agricultural economics. The MS degree may be taken with or without a thesis. The minimum MS course work requirement is 6 units (plus at least 2 units of thesis credit) for the thesis degree and 9 units for the nonthesis degree.

Doctor of Philosophy. In addition to maintaining a 4.0 average in formal course work, PhD students are required to take an oral preliminary examination and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to have competence in English. A minimum of 24 units of credit work beyond the baccalaureate degree is required.

PHILOSOPHY

Chair of the Department: R.L. Schacht

Correspondence and Information: Inquiries and correspondence should be directed as may be appropriate either to the Chair, the Director of Graduate Studies, or the Admissions and Financial Aid Committee, Department of Philosophy, University of Illinois at Urbana-Champaign, 105 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.E. Caton, A. Melnick, R.D. Mohr, R.L. Schacht, J.D. Wallace, P.G. Winch

Associate Professors: M.W. Baron, H.S. Chandler, T.G. McCarthy, R.J. McKim, F.W. Neely, F.F. Schmitt, W.R. Schroeder, S.J. Wagner, R.G. Wengert

Assistant Professors: K. Akins, P.L. Maher, J. McMahan

Emeritus Professors: B.J. Diggs, M.H. Fisch, D.S. Shwayder, A.R. Turquette, F.L. Will

Master of Arts: The normal program of graduate study in philosophy is directed toward the PhD, but students who wish to work only for the master of arts degree may also be admitted.

Admission. The Graduate College admission requirements apply. Applicants need not have done the course work in philosophy expected of applicants to the PhD program, but must show some evidence of aptitude for graduate study in philosophy. Application materials required are the same as those for the PhD program.

Program Description. Students in the AM program may qualify for the degree by earning at least 8 units of graduate credit with at least a 4.0 grade-point average (A = 5.0), 6 of which must be earned in regular courses; by satisfying a one-year residence requirement; by submitting a substantial essay; and by passing an oral examination on this essay. (There are no area, logic, or foreign language requirements for this degree.) An AM degree earned in this way is usually a terminal one. Students admitted to the AM program may, however, petition to the department for admission to the PhD program either prior to or upon the completion of their requirements for the AM degree. (Students in the PhD program are automatically awarded this degree when they complete the second stage of the PhD program and are not required to submit the substantial essay or to pass the oral examination required for the terminal AM degree.)

Doctor of Philosophy

Admission. The Graduate College admission requirements apply. In addition, applicants should have had a course in symbolic logic and general courses in the history of ancient and early modern philosophy. Students deficient in these areas may be admitted, but they are required to remedy their deficiencies by taking such courses in their first year. Applicants should also have done some course work in such central areas of philosophical inquiry as ethics and the theory of knowledge. All applications for admission must be supported by three letters of recommendation from persons qualified to comment on the applicant's aptitude for graduate study in philosophy. All applicants are also urged to take the general aptitude portion of the Graduate Record Examination and to submit their scores. They are further urged to submit a sample of their written work. International applicants whose native language is not English should take the TOEFL examination and submit their scores. (A score of at least 600 is required for regular admission.)

Program Description. The PhD program has three stages. (1) The first stage is completed when a student has earned 8 units of graduate credit or is deemed completed if the student has received a master's degree in philosophy elsewhere. (2) The second stage is completed when the student has earned 8 additional units (or, having received a master's degree previously, has earned and has been allowed transfer credit for a total of 16 units) and has satisfied the preliminary examination requirement, a course distribution requirement, a foreign language requirement, and a logic requirement (see below). At least 12 of the 16 units must be earned in regularly scheduled courses and seminars, and at least 5 must be earned in seminars. (3) The third stage is completed when the student has earned another 8 units of graduate credit (usually in seminars and thesis research) and has satisfied the thesis and doctoral oral examination requirements (see below). A minimum grade-point average of 4.0 (A = 5.0) is required for the PhD degree. Candidates must also satisfy the Graduate College residence requirement.

Candidates need not take work in a minor field outside of the department. In cases in which advanced study in philosophy would be enhanced by study in a related discipline, students may use such related course work to satisfy the credit requirements for the degree. Credit toward the satisfaction of these requirements in such cases is limited to 2 units. If a student wishes the work to count as an extradepartmental minor, the minimum number of units accepted is 2 and the maximum is 4.

The department offers three main fields of concentration: (1) the history of philosophy (including recent Anglo-American philosophy and Continental philosophy); (2) the theory of knowledge (including philosophy of science and philosophy of language) and metaphysics (including philosophy of mind and philosophy of religion); and (3) ethics and value theory (including social and political philosophy and aesthetics). Students may specialize in any of

these areas but must demonstrate competence in all of them. Two graduate-level courses must be taken in each of these three areas (the course distribution requirement). The two-part preliminary examination covers the latter two areas, with a knowledge of the history of philosophy to be demonstrated in each part.

Students must also demonstrate either (a) a basic reading knowledge of two of the following languages: German, French, Greek, and Latin; or (b) high proficiency in one of these languages. (Substitution of another language requires the permission of the chair of the department.) In addition, the student must demonstrate competence in symbolic logic, either by passing an approved course in the subject or by passing a proficiency examination administered by the department.

There is no separate master's degree requirement for PhD candidates. The AM degree in philosophy is automatically awarded to those who have not earned this degree previously elsewhere when they satisfy the above requirements.

After satisfying these requirements, a candidate for the PhD must submit an acceptable dissertation and pass a final, oral examination on the thesis. The acceptability of the thesis is judged and the final examination administered by the candidate's doctoral committee.

Candidates for the PhD who wish simultaneously to pursue advanced degrees in other disciplines (e.g., medicine or law) are permitted to do so. (For example, see the description elsewhere in this catalog of the Medical Scholars Program.)

Financial Aid. Financial aid is available to many students in the form of fellowships, assistantships, and waivers of tuition and service fees. The maximum period for which students may expect to receive financial aid is five years; exceptions may be made in some cases (e.g., when students are pursuing several advanced degrees simultaneously). Each year, the department reviews the performance of students receiving financial aid in order to determine whether their support should be continued. Students receiving transfer credit for graduate work in philosophy done elsewhere lose one semester of eligibility for financial aid for each 4 units of transfer credit allowed.

PHYSICAL SCIENCES

Correspondence and Information: D. Sechrest, University of Illinois at Urbana-Champaign, 368 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

Graduate Degree Programs. Two degree programs in physical sciences, one leading to the Master of Science in Physical Sciences and the other leading to the Master of Science in the Teaching of Physical Sciences, are offered for active or potential secondary school teachers. Teacher certification is required for admission to either program. A thesis is optional. No more than 2 units of thesis credit may be applied toward degree requirements. There is no language requirement. At least 3 units of credit applied to these degrees must be at the 400 level.

Master of Science. This program is designed to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa.

All courses in astronomy, chemistry, computer science, geology, mathematics, and physics that usually may be applied for graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus for which calculus is a prerequisite.

Master of Science in the Teaching of the Physical Sciences.
Students in this program must earn 4 units in the physical sciences, 2 units in education (see page 84), and 2 units of electives in education or physical science, or, in exceptional cases, in other fields.

PHYSICS

Head of the Department: A.C. Anderson

Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, 215 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: A.C. Anderson, G.A. Baym, M.K. Brussel, L.S. Cardman, S.J. Chang, P.D. Coleman, P.T. Debevec, P.G. Debrunner, J.G. Eden, G. Ehrlich, B.I. Eisenstein, R.A. Eisenstein, C.P. Flynn, E.H. Fradkin, H. Frauenfelder, D.M. Ginsberg, G.E. Gladding, A.V. Granato, E. Gratton, P. Handler, K. Hess, L.E. Holloway, N. Holonyak, I. Iben, E.A. Jackson, L.M. Jones, M.V. Klein, J.B. Kogut, U.E. Kruse, M.J. Kushner, F.K. Lamb, P.C. Lauterbur, A.J. Leggett, D.E. Mapother, R.M. Martin, J.M. Mochel, T. Ch. Mouschovias, A.M. Nathan, T.A. O'Halloran, V.R. Pandharipande, C.N. Papanicolas, C.J. Pethick, D. Pines, F.M. Propst, M.J. Raether, D.G. Ravenhall, M.B. Salamon, K. Schulten, R.O. Simmons, C.P. Slichter, L.L. Smarr, J.H. Smith, J.D. Stack, H.J. Stapleton, G. Stillman, J.D. Sullivan, J.J. Thaler, J.W. Truran, W.D. Watson, M.B. Weissman, J.E. Wiss, J.P. Wolfe, S. Wolfram, P.G. Wolynes, H.W. Wyld, R.D. Young, H. Zabel

Associate Professors: D. Ceperley, Y.C. Chang, T.C. Chiang, S. Errede, G. Gollin, S.A. Lamb, K.Y. Lo, H. Morkoc, M.H. Nayfeh, Y. Oono, R.L. Schult, M. Stone, D.C. Sutton, L.A. Thompson, D.J. Van Harlingen, J. Wambach

Assistant Professors: D.H. Beck, P.M. Goldbart, N.D. Goldenfeld, S. Granick, D.W. Hertzog, J.M. Izen, T.M. Liss, G.M. Mozurkewich, N.H. Packard, D.N. Ruzic

Graduate Degree Programs. The department of Physics offers graduate work leading to the master of science and the doctor of philosophy degrees. There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, biomolecular, and surface physics; the properties of liquid helium; laser spectroscopy of atoms; nonlinear dynamics; and complex systems. Graduate study in several areas of applied physics is available in conjunction with other departments in the University.

Admission. Requirements for admission to the graduate program in physics, in addition to those of the Graduate College, are 20 hours of physics, excluding courses in general physics and including a semester of intermediate theoretical mechanics, and two semesters of intermediate electricity and magnetism or the equivalent. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics, and undergraduate study of a foreign language are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science. This program requires 8 units of graduate courses and is usually completed in one year of full-time study by students entering in full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the graduate advising office of the Department of Physics.

Doctor of Philosophy. Students working for the PhD degree usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following eighteen months. Departmental requirements for the doctor of philosophy degree, in addition to the general requirements of the Graduate College, are described in a pamphlet that may be obtained from the graduate advising office of the Department of Physics.

Related Programs. For information concerning astronomy, see page 64; for information concerning atmospheric sciences, see page 66; for information concerning biophysics, see

page 124; for information concerning geophysics, see page 99. A doctoral program in chemical physics is described on page 71.

PLANT PATHOLOGY

Head of the Department: Richard E. Ford

Correspondence and Information: Head, Department of Plant Pathology, University of Illinois at Urbana-Champaign, N519 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.L. Crane, S.K. Farrand, R.E. Ford, L.E. Gray, M.E. Irwin, S.M. Lim, R.D. Neely, P.D. Shaw, M.C. Shurtleff, J.B. Sinclair

Associate Professors: C.J. D'Arcy, D.I. Edwards, D.A. Glawe, H.W. Kirby, R.B. Malek, G.R. Noel, J.K. Pataky, J.D. Paxton, W.L. Pedersen, S.M. Ries, D.G. White, H.T. Wilkinson

Assistant Professors: L.L. Domier, D.A. Eastburn, C.E. Eastman, A.D. Hewings

Graduate Degree Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the master of science and doctor of philosophy degrees. All students are required to present themselves to the program-of-study committee for an oral examination in plant pathology after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; mycology; phytobacteriology; fungicides; physiology of fungi; biochemistry of plant diseases; biological control; disease resistance; etiology; epiphytology; soil-borne diseases; genetic and biotechnical engineering of microorganisms; and genetics and variability in plant pathogens.

Admission. Applicants for graduate study are screened by a departmental admissions committee. The Graduate College requirements, including the 4.0 (A = 5.0) minimum grade-point average, apply.

Master of Science. A candidate for the master of science must complete 8 units of credit, including the presentation of an acceptable thesis, and pass an oral examination. Three units must be in 400-level courses, and 2 of the 3 must be in the major field. Limited credit in equivalent courses earned at other institutions may be accepted at the discretion of the department head and the student's program-of-study committee. The candidate must maintain a minimum grade-point average of 4.0 (A = 5.0) for the master's program.

Doctor of Philosophy. Students working toward the PhD degree usually require three to four additional years beyond the master's. To qualify for the preliminary examination, 8 units of course work, including required courses, must be completed beyond the master's degree. An oral preliminary examination before five faculty members, including at least three within and one from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable thesis. A grade-point average of at least 4.0 is required for the PhD degree.

POLITICAL SCIENCE

Head of the Department: George T. Yu

Correspondence and Information: Director of Graduate Studies, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: I.H. Carmen, S.P. Cohen, S.K. Gove, R.E. Kanet, E.A. Kolodziej, D.F. Linowes, R.L. Merritt. P. Monypeny, S.S. Nagel, P.F. Nardulli, R.F. Rich, R.E. Scott, L.G. Seligmen, M.G. Weinbaum, R. Weissberg, F.M. Wirt, G.T. Yu, D.A. Zinnes
Associate Professors: B. Carroll, J.E. Cohen, P.F. Diehl, S.A. Douglas, A.B. Fields, J.H. Kuklinski, D.M. Pinderhughes, S.T. Seitz, M.E. Weinstein
Assistant Professors: M.L. Bowen, M.A. Krassa, J.W. Lepingwell, C.L. Mock, R.J. Staal

Graduate Degree Programs. The Department of Political Science offers graduate work leading to the degrees of master of arts and doctor of philosophy.

Admission. The Graduate College admission requirements apply for all programs. The student should have had a minimum of 20 hours of undergraduate work in political science and cognate disciplines such as economics, psychology, finance, sociology, and/or history. An applicant is required to submit Graduate Record Examination scores, and one with prior graduate work is required to submit an example of work written while a graduate student. The minimum TOEFL score, required of all international applicants whose native language is not English, is 590.

Master of Arts. Students can earn a Master of Arts in Political Science usually within one year. It entails the completion of 8 units and the achievement of a 4.0 GPA in all courses taken. A master's thesis is required.

Doctor of Philosophy. The course of study leading to a PhD in political science requires a minimum of three years of full-time study, culminating in the successful defense of a doctoral dissertation. Two of the three years must be spent in residence. University residence requirements also state that a doctoral candidate must spend two successive semesters in residence beyond the master's degree. A minimum of 24 units of academic credit are required, 8 of which may be units of dissertation research.

In addition to meeting Graduate College requirements, the Department of Political Science requires that students complete a "scope and methods" sequence, acquire proficiency in analytic skills and demonstrate expertise in several subfields within the discipline. The progress of PhD candidates is monitored at various points in the program. In addition to an interim evaluation, students must pass a set of qualifying examinations and present a dissertation proposal. Once the doctoral dissertation is completed, the candidate must successfully complete an oral, final defense.

PhD candidates concentrate in one of six fields of political study: American government and politics, comparative government and politics, international relations, or formal theory and empirical methodology.

Financial Aid. Students accepted in any of the above graduate programs are eligible to apply for financial aid. Most incoming students with good credentials and continuing students demonstrating satisfactory progress will receive some type of financial aid, but the type of aid and amount will vary. The Department of Political Science provides, on a competitive basis, aid packages of up to $10,000, plus waivers of tuition and partial fees. Financial aid is usually a combination of fellowship money and assistantships. Students not requiring or qualifying for these types of assistance may apply for a tuition and fee waiver. Limited amounts of aid are also available for such things as dissertation field research, internships, and the presentation of papers at professional meetings. The University of Illinois is also a participating member of the Committee on Institutional Cooperation, which provides predoctoral grants to facilitate research in developing countries.

PSYCHOLOGY

Head of the Department: Emanuel Donchin
Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 337 Psychology Building, 603 East Daniel Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: P. Arabie, D.A. Bernstein, W. Brewer, J. Campos, G.L. Clore, J.B. Cohen, M. Coles, J.H. Davis, E. Deiner, E. Donchin, D.E. Dulany, C. Dweck, C.W. Eriksen, R. Felner, M. Fishbein, M. Gabriel, D. Gentner, W.T. Greenough, J. Hirsch, C.O. Hopkins, L. Hubert, C.L. Hulin, L. Jones, F. Kanfer, S. Komorita, P.R. Laughlin, G. Logan, J. Malpeli, J.E. McGrath, D. Medin, N. Moray, E. Newport, R.D. Parke, J. Rappaport, E. Satinoff, E. Shoben, H.C. Triandis, S. Wasserman, C. Wickens, R. Wyer

Associate Professors: R. Baillargeon, G. Dell, F. Drasgow, F. Fincham, L. Fitzgerald, D. Funder, R. Hendersen, J. Juraska, A. Kramer, G. Miller, B. Ross, E. Roy, T. Srull

Assistant Professors: M. Aber, J. Andersen, M. Banich, H. Berenbaum, U. Bockenholt, P. Bowman, P. Carnevale, E. Dzhafarov, C. Fisher, J. Flach, S. Garnsey, G. Lintern, J. Rhodes, P. Sanderson, J. Sniezek, T. Supalla, E. Weber

Graduate Degree Programs. The Department of Psychology offers graduate work leading to the degrees of master of arts, master of science, and doctor of philosophy.

Doctor of philosophy programs are offered in the following areas of psychology: biological, developmental, cognitive and experimental, and clinical psychology; measurement; personality and social ecology; and social/organizational individual differences. The master of arts degree is awarded to students in the above programs as an intermediate degree. Master of science programs are offered as terminal degrees in personnel psychology, engineering psychology, and measurement psychology.

Admission. The Graduate College admission requirements apply for all programs. The candidate for admission to a master of arts or doctor of philosophy program should ordinarily have the following preparation: a minimum of 15 hours in psychology, a laboratory course in experimental psychology, a course in statistics, a one-year course in another laboratory science, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have some research experience. Applications for admission to part-time study are usually not approved.

Master of Arts. The master of arts degree is awarded as an intermediate degree to students who are candidates for the doctor of philosophy degree, when they have satisfactorily completed 8 units of graduate work, including an acceptable thesis.

Master of Science. The degree of Master of Science in Personnel Psychology, in Engineering Psychology, or in Applied Measurement is awarded as a terminal degree to candidates who have had an appropriate applied psychology undergraduate program and who now satisfactorily complete 8 prescribed graduate units in their specialty.

Doctor of Philosophy. The doctor of philosophy degree is awarded to candidates who complete an approved program in their area of specialization and meet departmental and Graduate College requirements for the degree. These must include: at least 24 graduate units beyond the bachelor's degree; satisfactory performance in courses or examinations dealing with quantitative methods, conceptual foundations of psychology, and chosen areas of specialization; a master's thesis or equivalent; appropriate advanced courses and seminars in the area of specialization and in related and supporting areas; satisfactory performance on a doctoral qualifying examination; satisfactory performance on an oral preliminary examination; completion of an acceptable PhD thesis; and satisfactory performance on an oral examination in defense of the thesis.

Although teaching is not a general Graduate College requirement, this department requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. This usually takes the form of a teaching assistantship for at least one semester.

Medical Scholars Program. This program allows the student interested in medicine and psychology to earn both the MD and PhD (in psychology) degrees while gaining unique multidisciplinary research experience and expertise.

Individually tailored programs of study can be developed within the general requirements of medical training and graduate study in psychology. Degree work will be arranged

to accommodate the scheduling requirements of both programs, but the course of study in psychology will be equivalent to that of all other doctoral candidates. More details about the Medical Scholars Program are available from associate dean for academic affairs, College of Medicine at Urbana-Champaign, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801.

RADIO AND TELEVISION

Acting Head of the Department: James W. Carey
Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

The Department of Radio and Television has suspended admission to its program leading to the master of science degree while it reviews the curriculum and decides on its plans for future instruction in broadcasting. Students interested in earning a master's degree in radio and television may write to the department head to learn the status of the department's plans. For the program leading to the Doctor of Philosophy in Communications, see page 78.

REGIONAL SCIENCE PROGRAM

Correspondence and Information: Regional Science Program, University of Illinois at Urbana-Champaign, 1 Observatory, 901 South Mathews Avenue, Urbana, IL 61801
Program Committee: G.J.D. Hewings (chair), P.F. Colwell, A. Getis, L.D. Hopkins, T.J. Kim, C.D. Kolstad, H.F. Williamson

Graduate Degree Programs. An interdisciplinary concentration in regional science is available for students enrolled in master's or doctoral degree programs in the following departments: civil engineering, economics, finance, geography, landscape architecture, or urban and regional planning. Program concentration varies by department and includes emphasis in transportation planning, regional development and planning, real estate and urban land economics, urban and regional analysis, and environmental systems and management. Core courses are taken in regional and social science theory, location theory, and methods of regional analysis. The specific core courses taken will depend upon background and major department. Further specialization may be pursued by making approved selections from among a rich array of more than forty regional science courses in the participating departments.

Admission. Prospective students should address inquiries to the program office. Applicants desiring a major or minor emphasis in regional science should seek admission to one of the cooperating departments. All degree candidates must complete the requirements of the department in which they enroll. Students specializing in regional science are expected to have a sound background in economics, statistics, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study.

RELIGIOUS STUDIES

Director of the Program: Gary G. Porton
Correspondence and Information: Program in Religious Studies, University of Illinois at Urbana-Champaign, 3014 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

The Program of Religious Studies, sponsors teaching, research, and public service in religious studies. Although the program does not itself offer graduate degrees, its eleven core faculty members as well as its seventeen associated faculty members, regularly teach graduate-level courses and serve on thesis committees for other departments. Students interested in pursuing graduate work in religious studies should contact the director of the program to determine how they can best pursue their interests.

ROMANCE LINGUISTICS

Graduate Degree Programs. An option in Romance linguistics is available to candidates for the doctor of philosophy in the Departments of French; Linguistics; and Spanish, Italian, and Portuguese. The curriculum is based upon appropriate course offerings in the three departments. Further information may be obtained from the executive officers of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: M.T. Choldin
Correspondence and Information: Director, Russian and East European Center, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: P.P. Bernard, M.T. Choldin, C.L. Dawson, J.D. Fellmann, R.T. Fisher, Jr., M. Friedberg, J. Gorecki, F.M. Gottheil, K.A. Hitchins, H.H. Hock, R.C. Jennings, R.E. Kanet, M.J. Kenstowicz, P.B. Maggs, M. Marcovich, J.P. McKay, J.R. Millar, L.H. Miller, B. Nettl, J.A. Nichols, T. Pachmuss, A.L. Ringer, S.C. Schmidt, H.M. Schoenfeld, K.H. Schoeps, P.W. Schroeder, D.M. Shtohryn, M.G. Weinbaum, L. Zgusta
Associate Professors: M.H. Berry, E.C. Bristol, R. Dunatov, F.Y. Gladney, S.P. Hill, R.G. Ousterhout, M.M. Shorish, O. Soffer-Bobyshev, R. Tempest, B.P. Uroff
Assistant Professors: J.W.R. Lepingwell, N. Pervukhin, M. Spagat, A.M. Verner

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is offered by the Russian and East European Center in cooperation with various departments. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follows: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least 6 graduate units in course work relating to Russia, of which at least ½ unit must be Library and Information Science 433C. The remaining units must be distributed among at least three of the departments represented in the program (anthropology, economics, geography, history, law, library and information science, political science, Slavic languages and literatures, and sociology) other than the student's own major department. If the student's major department is one of these nine, up to 1 unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources, which must meet, at the minimum, the standard usually required in a master's thesis. A copy of the student's master's or doctoral thesis may be submitted in fulfillment of this requirement.

SLAVIC LANGUAGES AND LITERATURES

(Including Bulgarian, Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, and Ukrainian)

Head of the Department: Maurice Friedberg
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.L. Dawson, M. Friedberg, T. Pachmuss
Associate Professors: E. Bristol, R. Dunatov, F.Y. Gladney, S.P. Hill, R. Tempest
Assistant Professor: N. Perkvukhin

Graduate Degree Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of Master of Arts in Russian, Master of Arts in the Teaching of Russian, and doctor of philosophy with specialization in Russian literature or Slavic linguistics.

Admission. Prospective graduate students of Slavic languages and literatures should have had the equivalent of at least three years of college Russian and some advanced course work in Russian literature. Some acquaintance with other languages and literatures is desirable. Students choosing Russian or other Slavic languages and literatures as a minor subject should consult the department. The Graduate College admission requirements apply.

Master of Arts in Russian. In addition to fulfilling the requirements of the Graduate College, candidates must pass both a written and an oral examination in their major and must pass the Russian proficiency examination. Students may specialize in literature or linguistics. All students must complete a departmental core program composed of courses in literature and linguistics. No master's thesis is required.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian (5 units, including at least 2 units from courses open only to graduate students); (2) education (2 units, including 1 unit in educational psychology and 1 unit in educational policy studies); and (3) electives (1 unit). These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 84 for teacher certification requirements.

Doctor of Philosophy. All candidates for the PhD must fulfill the general requirements of the Graduate College and must have a reading knowledge of two non-Slavic languages, ordinarily French and German. A student may choose literature or linguistics as a major field. In addition to satisfying departmental language proficiency requirements, students must complete 8 units of course work beyond the AM degree, of which at least 5 are within the student's major field of study. The student must also complete a minor consisting of three graduate-level courses in a single field, or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another modern Slavic language or literature in the original language. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other modern Slavic languages or literatures in the original languages. A thesis is required for the degree of doctor of philosophy.

Graduate courses are offered in the following Slavic languages: Bulgarian, Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, and Ukrainian.

Financial Aid. Several forms of financial assistance, including University fellowships, Foreign Language and Area Studies (Title VI) Fellowships, teaching assistantships, research assistantships, and tuition and service-fee waivers are available. There are also opportunities for part-time related work in the Slavic and East European Division of the University Library and elsewhere on the campus. Virtually all students making satisfactory progress are assured of some form of financial assistance and also receive the opportunity to acquire classroom teaching experience.

Research Interests. Major areas include East, West, and South Slavic linguistics; language teaching pedagogy; and computer-assisted language teaching. In literature, the fields of specialization include Russian literature of all periods, particularly of the nineteenth and twentieth centuries, Russian literature and society, emigre Russian literature, the Russian romantic and symbolist poets, Russo-Western literary and cultural contacts, and Russo-Jewish literary relations. Other major areas of interest represented include the Soviet and East European cinema, literary translation, Polish literature, and Slavic folklore.

The University of Illinois at Urbana-Champaign has one of the country's two or three outstanding Slavic library collections. The Illinois Summer Research Laboratory on Russia and Eastern Europe brings to the campus more than one hundred postdoctoral researchers from all over the country every year to take advantage of the Slavic library resources. The library's unique Slavic reference service is in year-round operation, answering queries from libraries and individual scholars throughout the country.

SOCIAL STUDIES

Correspondence and Information: N.G. Parker, Chair, Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

Master of Arts in the Teaching of Social Studies. Candidates for admission should hold secondary school social studies teaching certificates. The Graduate College admission requirements apply.

Graduate Degree Program The program requires 8 units of graduate work. Of these, 4 units are to be in the social studies (2 must be in history); 3 units in educational psychology, educational policy studies, and secondary and continuing education; and 1 unit in an elective chosen in consultation with the director of the program.

SOCIAL WORK

Acting Dean of the School: Paula A. Meares
Correspondence and Information: Director of Student Affairs, School of Social Work, University of Illinois at Urbana-Champaign, 1207 West Oregon Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. R. Balgopal, K. Gould, P. A. Meares, E. V. Mech, M. A. Taber
Associate Professors: C. D. Cowger, R. A. Downing, E. N. Gullerud, J. D. Kagle, M. M. Monkman, A. J. Vattano, N. A. Weinberg
Assistant Professors: N. Gustavsson, A. Halter, S. Wernet, S. Kopels

Graduate Degree Programs. The School of Social Work offers programs leading to the Master of Social Work and the doctor of philosophy degrees.

Master of Social Work. The master's degree provides specialized study for advanced social work practice. Students take foundation and advanced courses in social work methods, organization and services, research, human behavior and the social environment, and field instruction. (A twenty-nine week field placement in a social service agency is required.) A total of 14 to 16 units of graduate course work is required for the MSW degree, and the curriculum may be completed in sixteen to eighteen months of full-time study. Students choose from one of the following areas of specialization: child welfare, health care, community mental health, and school social work. Within each specialization, a direct service or an indirect service focus may be pursued. Students who wish to specialize in aging, marriage and family practice, occupational social work, substance abuse, or another individualized plan of study will have the opportunity to develop the area with a faculty adviser.

Admission. For the MSW program, applicants must meet the following minimum requirements: (1) a baccalaureate degree from an accredited college or university in the United States or from a recognized institution of higher learning abroad; (2) a grade-point average of 4.0 (A = 5.0) for the last 60 semester hours of undergraduate work; (3) 20 hours of completed course work in social, biological, and behavioral sciences; (4) evidence of personal attributes that are suitable for the profession of social work; (5) results of the Test of English as a Foreign Language (TOEFL) for any applicant whose native language is not English; (6) a course in elementary statistics; (7) a course in human development covering the life span; (8) foundation knowledge in human behavior and the social environment, including the family, small groups, communities, and organizations, as well as human biology; (9) a foundation course in research methods; (10) a written supplementary statement.

Doctor of Philosophy. The PhD program is typically a 16-unit program for students who enter with an MSW degree. The program is interdisciplinary and has a strong research emphasis. Anthropology, economics education, labor and industrial relations, political science, law, psychology, sociology, and urban planning are among the disciplines that contribute to the program. Candidates prepare for leadership in teaching, research, and policy analysis, development, and implementation.

Admission. The PhD program is open to students who demonstrate a potential for research and other scholarly work and leadership in the field of social welfare and the allied professions, and who have had education in social work or in related professions or disciplines. A grade-point average of "B" is required for consideration. The Graduate Record Examination, three letters of recommendation, an example of written work, and in some cases the Test of English as a Foreign Language (TOEFL) are also required.

SOCIOLOGY

Head of the Department: James R. Kluegel
Director of Graduate Studies: Barbara Reskin
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Arabie, D.J. Bordua, H. Choldin, N. Denzin, J. Gorecki, L. Hargens, R. Jones, J.R. Kluegel, G. Lueschen, B. Reskin, J. Robinson, R. Schoen, J. Spaeth, S. Sudman, J.C. van Es, R. Warnecke
Associate Professors: W. Cockerham, A. Flood, C. McPhail, J. Mirowsky, A. Pickering, C. Ross, R. Sampson, A. Sofranko, M. Solaun, K. Southwood, G. Stevens, G. Swicegood, W. Trent, S. Wasserman, N. Wiley
Assistant Professor: W. Martin
Emeritus Professors: W. Form, N. Jacobs, H. Johnson, B. Karsh

Graduate Degree Programs. The Department of Sociology offers graduate work leading to the master of arts and doctor of philosophy degrees.

Admission. The Graduate College admission requirements apply. Students applying for admission should have a strong background in one of the social sciences, preferably sociology. Applicants must submit Graduate Record Examination scores on the tests of verbal ability, quantitative ability, and the advanced test in sociology.

Doctor of Philosophy. Considerable specialization around a core of sociological knowledge is encouraged to prepare students for careers in research and teaching at the college and university level and for research careers in government and industry. Departmental programs include population studies; comparative sociology; criminology; social psychology; medical sociology; work, stratification, and organizations; sociology of science; and rural sociology. Required courses include sociological theory, statistics, research methods, demography, social organization, and social psychology. Candidates must also be examined in at least one substantive area plus an area of specialization for doctoral dissertation research. Additional information can be found in the *Sociology Handbook for Graduate Students,* available from the department.

Master of Arts. The master of arts program is generally viewed as a first (and optional) step toward the doctorate. Admission requirements are indicated above. A candidate for the AM degree in sociology must earn 10 units of graduate credit or 7 units of course work plus an acceptable master's thesis. The course work must include research methods and one advanced course in statistics.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan)

Head of Department: I.A. Schulman
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: S.W. Baldwin, W.C. Blaylock, A.K. Cassell, E.P. Garfield, R.E. Lott, A. Porqueras-Mayo, I.A. Schulman

Associate Professors: A. Aiex, P.W. Borgeson, T.C. Meehan, A. Musumeci, B. VanPatten, J.C. Wilcox

Assistant Professors: L.E. Delgado, V. Diaz-Balsera, J.I. Hualde, J.F. Lee, P. Sharpe-Valadares

Graduate Degree Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy degrees in Spanish, in Italian, and in Portuguese, to a Master of Arts degree in the Teaching of Spanish, and to a Doctor of Philosophy degree in Second Language Acquisition in Teacher Education (SLATE) in Spanish, in Italian, and in Portuguese. Fields of concentration are Spanish linguistics, Romance linguistics, Spanish literature, Latin American literature, Italian linguistics, Italian literature, and Portuguese language and literature. Graduate courses in Catalan are available.

Admission. The Graduate College admission requirements apply. The normal prerequisite for a graduate major is an undergraduate major in the corresponding Romance language or consent of the department. It is recommended that applicants living in the United States submit Graduate Record Examination scores for the aptitude test. Students doing graduate work for any advanced degree in Spanish, Italian, or Portuguese must possess a command of the language.

The programs offered are described below. For additional information, consult the department.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and a general reading list. The following areas of specialization are offered in Spanish: Spanish and Spanish American literature, Spanish linguistics, and applied Spanish linguistics. The following areas of specialization are offered in Italian: Italian literature, Italian linguistics, and applied Italian linguistics. The following areas of specialization are offered in Portuguese: Brazilian literature and Portuguese literature. Detailed statements of the requirements for each specialization may be obtained from the department.

Master of Arts in the Teaching of Spanish. An applicant must have a bachelor's degree in either Spanish or teacher education. Candidates must complete a total of 9 units to be taken in various areas (Spanish, foreign language learning, general education, linguistics, etc.) approved by the adviser in conjunction with the candidate's interests, background, and needs.

Doctor of Philosophy. The following areas of specialization are offered in Spanish: Medieval literature, Renaissance and Golden Age literature, Spanish literature of the nineteenth and twentieth centuries, Latin American Colonial literature, Latin American Modern literature, Spanish linguistics (with various subfield specializations), and Romance linguistics (with various subfield specializations). The following areas of specialization are offered in Italian: Medieval literature, Renaissance literature, Baroque literature, Enlightment and Romanticism, Modern literature, Italian linguistics (with various subfield specializations), and Romance linguistics. The following areas of specialization are offered in Portuguese: Medieval literature, Renaissance literature, Modern literature, Brazilian literature (through Romanticism or after 1881), and Romance linguistics.

The option in SLATE is available to candidates with an MA degree in Spanish (applied linguistics), Italian (applied linguistics), Portuguese, and at least one year of experience teaching in a second language context. Candidates selecting this option are required to complete courses in linguistics, psycholinguistics, sociolinguistics, and curriculum development, in addition to advanced study in Spanish, Italian, or Portuguese linguistics. Also required are 2 units in research methodology.

Although teaching is not a general Graduate College requirement, this department usually requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Financial Aid. The department offers fellowships to outstanding applicants to the graduate program and regularly provides a large number of teaching assistantships, research assistantships, and fellowships for the study of the works of Jose Marti. The Graduate College fellowship competition is open for qualified minority candidates. Other fellowships and grants are available in campuswide competitions (Latin American Center grants, dissertation research grants, summer fellowships, and others).

SPEECH AND HEARING SCIENCE

Acting Head of the Department: Marlyn A. O'Neill
Correspondence and Information: Head, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, 901 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.C. Bilger, J.J. O'Neill, E. Yairi
Associate Professors: J.G. Erickson, C.J. Johnson, D.P. Kuehn, M.A. O'Neill, R.K. Simpson
Assistant Professors: R.D. Chambers, L.E. Rowan
Emeritus Professors: F. Johnson, E. Paden, W.R. Zemlin

Graduate Degree Programs. The department offers courses leading to the master of arts and doctor of philosophy degrees, with specialization in audiology, language development and its disorders, speech or hearing science, and speech pathology.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination is required for all curricula. Desired background should include 16 hours of undergraduate credit in the following areas or their equivalent: speech pathology, audiology, phonetics, anatomy and physiology of the vocal mechanism, hearing science, speech science, and voice science.

Master of Arts. In pursuing a master of arts, the student may concentrate in one of four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. This degree may be taken as either a terminal degree or as preparation for further graduate study.

For students seeking a terminal degree, the master of arts program is designed to ensure them clinical competence in audiology or speech/language pathology necessary for employment in a hospital, clinic, residential center, or school system. Successful completion of this program ensures that the student has met the academic and clinical requirements for American Speech-Language-Hearing Association (ASHA) certification and can possibly qualify for state certification.

For a student seeking a nonterminal degree, the master of arts program enables the student to undertake fundamental course work that will be an integral part of an overall doctoral program.

The student's program for the master of arts degree will be determined on an individual basis, taking into consideration the Graduate College and departmental requirements. It will be composed of 10 to 13 units from the four specialized areas and related areas. At least 6½ to 7 units must be at the 400 level. The only courses required of all master of arts candidates are Speech and Hearing Science 399 (Design and Analysis of Experiments in Speech and Hearing Science) and Speech and Hearing Science 496 (Proseminar in Speech and Hearing Science). A master's thesis should be part of the predoctoral student's plan of study. A student seeking a master of arts as a terminal degree is encouraged to do a thesis as educational enrichment.

Doctor of Philosophy. Admission to the doctoral program requires completion of a master's degree, or the equivalent, in speech and hearing science or a related area. The program may be planned with specialization in any one of the four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. The minimum academic course requirements for this degree are 8 units beyond the master's degree and a

thesis. If there are deficiencies in the student's background, additional courses will be required, and courses taken for this purpose usually are not counted toward the minimum requirement. In addition, a doctoral candidate who did not write a thesis as part of the master's program will be required to complete the equivalent of a master's thesis, and these 2 units will not count toward the minimum academic requirement of 8 units. Individual programs of study will be tailored to the special needs of the student and are planned by the student and the adviser.

If the student enters with no deficiencies, the first year or two of the doctoral program is typically devoted to course work in the area of concentration selected by the student and terminates when the preliminary examination is passed. Subsequent time is devoted to research on a special topic and culminates with the writing of a thesis and passing an oral examination in its defense.

SPEECH COMMUNICATION

Head of the Department: Jesse G. Delia
Director of Graduate Study: Daniel J. O'Keefe
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: K.E. Andersen, J.J. Bateman, R.A. Clark, J.G. Delia, C. Kramarae, J.H. Maclay, D.R. Seibold
Associate Professors: T.M. Conley, D. Desser, L. Grossberg, B.J. O'Keefe, D.J. O'Keefe, D.L. Swanson, J.W. Wenzel
Assistant Professors: N.S. Contractor, A.L. Darling, M.H. Dorfman, D.P. Gaonkar, J.W. Hay, B.J. Tinsley

Graduate Degree Programs. The Department of Speech Communication offers courses leading to the master of arts, the doctor of philosophy, and the Master of Arts in the Teaching of Speech Communication degrees. Specific information on programs of graduate study and financial aid is supplied to all who request it. Financial aid is usually in the form of part-time teaching assistantships.

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination and a sample of written academic work are required in all curricula.

Master of Arts. For the degree of master of arts, students may concentrate in rhetorical and communication theory or in interpretation. The entering student should present the equivalent of 16 hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general graduation requirements of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional, but may constitute a maximum of 2 units of credit.

Master of Arts in the Teaching of Speech Communication. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College and departmental requirements, including the comprehensive examination, MAT candidates must complete 6 units of work in the department plus the units of required work in education (see page 84).

Doctor of Philosophy. For the doctor of philosophy degree, students may concentrate in rhetoric and communication theory or interpretation. Students are accepted as candidates for the PhD degree who present either a well-rounded undergraduate education with an emphasis in speech communication and a master's in a cognate discipline, or who hold a master's degree in speech communication from an accredited institution.

In addition to meeting general requirements of the Graduate College, the student must satisfactorily complete written and oral preliminary examinations, an oral defense of the thesis prospectus, and an oral defense of the thesis. Students must demonstrate competency in research procedures and tools that may include proficiency in one or more foreign languages, various research methods, or cognate academic work.

STATISTICS

Head of the Department: Jerome Sacks
Correspondence and Information: Department of Statistics, University of Illinois at Urbana-Champaign, 101 Illini Hall, 725 South Wright Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.E. Bohrer, D. Burkholder, I.J. Hubert, P.B. Imrey, K. Joag-Dev, F.B. Knight, J.I. Marden, W. Philipp, S.L. Portnoy, J. Sacks, W.F. Stout, S. Wasserman
Associate Professors: D.D. Cox, A.T. Martinsek, D. Monrad
Assistant Professors: J. Alho, A.R. Barron, D.G. Simpson, Z. Ying
Emeritus Professor: R.A. Wijsman

Graduate Degree Programs. The Department of Statistics offers graduate study leading to the master of science or master of arts, the Master of Science in Applied Statistics with Specialization, and the Doctor of Philosophy in Statistics.

Admissions. The Graduate College admission requirements apply. Students are expected to have a strong undergraduate mathematics background, but need not have an undergraduate statistics or mathematics degree. Students may be admitted with deficiencies which are to be removed during the first year of graduate work.

Masters's Degree Program. The MS and MA degrees in Statistics require 8 units of graduate course work covering both theoretical and applied material. Statistics 324, 325, 326, 327, 410, and 411 are required. At least one additional course at the 400 level is also required. There is no language or thesis required, and there are no comprehensive examinations.

Master's Degree with Specialization. The Department of Statistics offers the Master of Science degree in Statistics with specialization in a variety of areas of application. The degree program consists of a core of three courses in basic statistical theory from the Department of Statistics, a course in general data analysis, and further course work in a particular discipline as required separately for each specialization. The program offers an additional degree for students earning an advanced degree in the area of application or provides the primary degree for a master's candidate in applied statistics who is interested in specific disciplinary application.

To be eligible for this program, a student must be accepted into either the unit offering the specialization or the Department of Statistics. The following areas of application are now available: social statistics (Department of Sociology); psychometrics and behavioral statistics (Departments of Psychology, Educational Psychology, and Speech and Hearing Science); biostatistics (Department of Biology and Medical Scholars Program); statistical genetics (Departments of Agronomy and Animal Science).

Full statements of degree requirements are available from the head of the unit offering a specialization or from the head of the Department of Statistics.

Doctoral Degree Program. A total of 24 units after the baccalaureate is required for the doctor of philosophy degree. These include Statistics 324, 325, 326, 327, 356, 410, 411, 425, 453, 454, 471, 475, and 478. This degree also requires successful completion of the qualifying examination (consisting of examinations on Statistics 324-325, 410-411, and 453-454); a thesis in an area of theoretical computational or methodological statistical research; and a final examination on the thesis.

Financial Aid. Financial aid is available primarily in the form of teaching assistantships, research assistantships, and fellowships. For further information write to the head of the department.

THEATRE

Head of the Department: David Knight
Correspondence and Information: Head, Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.C. Ahart, J.B. Harris, B.M. Hobgood, R. Isackes, D. Knight, W. McClure Knight, R. Tymchyshyn, B.R. Works
Associate Professors: K. Brindle, J. Dunn, R. Graves
Assistant Professor: C. Libkin, R. McFarquhar, T. Mitchell, K. Perkins

Graduate Degree Programs. The Department of Theatre offers graduate work leading to the degrees of master of arts, master of fine arts, and doctor of philosophy.

Admission. Applicants will be considered if they present transcripts documenting undergraduate or graduate study of dramatic literature, theatre history, and theatre practice; in the case of the MFA degree, intensive experience in performance and/or production of plays is necessary, whether or not this activity occurred in an academic context. The faculty expects all applicants to have a cumulative grade-point average of at least 4.0 (A = 5.0) in the study of theatre subjects; AM and PhD candidates are to have a 4.0 grade-point average in all subjects studied at the graduate or undergraduate levels.

Master of Arts. A candidate for the AM degree must spend at least two semesters in residence; must complete at least 8 units of course work in theatre and related studies, including at least 5 units in history and theory of theatre and 2 in applied theatre; and must pass a final comprehensive examination. Three units must be at the 400 level, and 2 of the 3 must be in theatre. A full-time student can complete this program in one academic year.

Master of Fine Arts. The MFA is a terminal degree in theatre practice. Approved areas of specialization include acting, costume design, lighting design, scene design, stage management, and theatre technology. The candidate for the degree must be in residence six semesters and complete 18 units. Course work must include at least 8 units in studio, colloquium, or creative projects, and 3 others in department-approved electives. Only full-time students will be admitted to the program; residence only in summer sessions will not suffice.

Doctor of Philosophy. Requirements for the degree are a minimum of 8 units in courses in theatre and related studies beyond the master's degree; a reading knowledge of two foreign languages or of one foreign language and one of the prescribed substitutes; a minimum of 8 units of thesis research; a comprehensive oral and written examination; and defense of the dissertation before a committee of the graduate faculty. The program requires two to three years beyond the master's degree to complete.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: Frank J. Rizzo
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 216 Talbot Laboratory, 104 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.J. Adrian, D.E. Carlson, M.E. Clark, H.T. Corten, G.A. Costello, R.E. Johnson, R.E. Miller, J.W. Phillips, F.J. Rizzo, R.T. Shield, J.S. Walker, S.S. Wang
Associate Professors: R.B. Haber, J.G. Harris, N. Riahi, D.S. Stewart, R.L. Weaver
Assistant Professors: A. Agah-Tehrani, C.J. Lawrence, T.G. Shawki

Graduate Degree Programs. The graduate programs in the Department of Theoretical and Applied Mechanics lead to the master of science and doctor of philosophy degrees. Major areas of study and research are applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics.

Admission. Applicants should have the bachelor's or master's degree in engineering, mathematics, physics, or related fields and meet the Graduate College requirements for admission.

Master of Science. Candidates are required to complete a minimum of 8 units of graduate work including a thesis (ordinarily 2 units) and to maintain a minimum grade-point average of 4.0 (A = 5.0). Students are required to register for the seminar in engineering mechanics. If a student elects not to present a thesis, 9 units of course work are required. Three units must be at the 400 level, and 2 of the 3 must be in theoretical and applied mechanics. A full-time student can usually complete this program in one academic year of study. A student who has an assistantship can usually complete the requirements in one calendar year.

Doctor of Philosophy. Candidates for the doctor of philosophy degree are required to complete 8 units of course work beyond the master's degree with a minimum grade-point average of 4.0. One course (or the equivalent) is required from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics. Students are required to register for the seminar in engineering mechanics. A student must pass an oral preliminary examination before commencing the thesis. The thesis research usually comprises about half of the work beyond the master's degree. A full-time student can usually complete the PhD program in two years of study beyond the master's degree.

Financial Aid. Half-time teaching and research assistantships allow students to take three-quarters of a full schedule of graduate courses. Stipends are based on the student's year in graduate work and on the percentage of time spent on the assistantship. Teaching and research assistantships carry with them waivers of tuition and some service fees. Assistantship applications can be made at any time before the term of entrance. Some University fellowships are also available.

Research Interests. Some of the areas of theoretical and experimental research currently being investigated by graduate students and faculty members are residual stresses, induced anisotropy, wire and wire-rope mechanics, ceramic fibers, polymeric materials, laminates, continuum theory of composites, curing stresses in composites, advanced metal-matrix and ceramic-matrix composites, thick-section composites, fatigue of composites, damage mechanics, finite-element methods, finite-difference algorithms, deformation gradients in solids, shear-flow localization, anisotropic buckling, stability of layered materials, second-order elasticity, beam flexure and torsion, spin coatings, rotational molding, detonation physics, atmospheric turbulence, particle-image velocimetry, thermal convection, multi-phase flow, stratified fluids, cerebral circulation, microcontamination, crystallization of melts, shear-layer instabilities, ultrasonics, acoustic imaging, and thin-film wave scattering.

URBAN AND REGIONAL PLANNING

Head of the Department: Lewis D. Hopkins
Correspondence and Information: Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 907½ West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.W. Forrest, L.F. Heumann, G.J.D. Hewings, L.D. Hopkins, T.J. Kim, G.C. Lim
Associate Professors: P.D. Phillips, L.L. Osborne
Assistant Professors: K.P. Donaghy, G.J. Knapp, R.L. Mattingly, R.B. Olshansky

Graduate Degree Programs. The Department of Urban and Regional Planning offers graduate work leading to the degrees of Master of Urban Planning and Doctor of Philosophy in Regional Planning. Students can also apply to dual degree programs to obtain a Juris Doctor and a Master of Urban Planning or a Master of Architecture and a Master of Urban Planning.

Admission. While the social sciences, the physical sciences, the design professions, engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities and other fields. The Graduate College admission requirements apply. International applicants must score 590 or better on the TOEFL. The Graduate Record Examination is recommended for persons who desire consideration for any type of financial aid. The additional requirements described below apply for admission to the doctoral program.

Master of Urban Planning. The fully accredited master's degree program prepares students for careers in professional practice. Such careers involve public service at all levels of government, private consulting practice, or other organizations in need of planning services. The program also may prepare students for advanced work leading to the PhD degree and a career in teaching and research. The program combines a set of core requirements with a student selected concentration and electives. The program ordinarily requires two years. First-year students take courses focusing on the basic elements of planning, including planning theory, land use, history, analytical methods, spatial organization, and implementation. The second year provides opportunity for further work in areas of specialized interest, including environment, economic development, regional science, information systems, land use, housing, community development, transportation, and preservation planning. A thesis or a master's project is required. An internship during the summer between the first and second year is highly recommended.

To qualify for the Master of Urban Planning degree, a student must complete a minimum of either (1) 15 units, if a zero-credit internship course (Urban Planning 490) is successfully completed or (2) 16 units, if the internship course is not elected. At least 10 units must be in urban and regional planning courses (9 units for students completing Urban Planning 490). At least 4 units must be at the 400 level, and 3 of these must be in urban and regional planning.

Doctor of Philosophy in Regional Planning. The doctoral program is offered in close cooperation with an interdisciplinary program faculty. The program is designed to educate researchers and teachers for university positions as well as specialized practitioners for the public and private sectors. The program emphasizes environmental science and social science aspects of regional planning and incorporates the necessary background in research methods and planning theory and application. Students wishing to pursue environmental science aspects of regional planning should have completed at least three courses in physics, chemistry, or biology; one semester of college-level calculus or linear algebra; one semester of statistics; and one semester of economics. Students wishing to pursue social science aspects of regional planning should have completed at least one semester of economics; three semesters of economics, political science, or sociology; one semester of statistics; and one semester of college-level calculus or linear algebra. Students otherwise qualified may be admitted with deficiencies in these areas. Deficiencies may be removed by passing proficiency examinations or by taking courses after admission to the program, but courses taken for this purpose will not count toward fulfillment of degree requirements.

To qualify for the PhD in Regional Planning, 24 units of credit must be completed. The student entering with the baccalaureate degree will be required to complete at least 16 units of course credit and up to 8 units of dissertation credit. The student entering with a master's degree in planning or a closely allied field generally will be required to complete a minimum of 8 units of course credit and up to 8 units of dissertation credit. A maximum of 8 units of

advanced-standing credit may be granted. All student programs will consist of courses in planning research methods and planning theory and application. Depending on the program emphasis that a student selects, appropriate courses in environmental science or social science aspects of regional planning will be chosen in consultation with the student's academic adviser. The student must pass a qualifying examination, a preliminary examination of the dissertation proposal, and a final examination on the dissertation.

Financial Aid. Fellowships, tuition and service fee waivers, teaching assistantships, and research assistantships are available each year. Financial aid is awarded on the basis of the student's previous academic record and other indicators of potential. In the case of assistantships, the possession of specific teaching or research capabilities is a consideration.

Faculty Research Interests. Members of the faculty are engaged in research, public service, and continuing education through the Bureau of Urban and Regional Planning Research. These efforts are undertaken in the areas of land use, economic development, environmental planning, housing, information systems, social planning, transportation, preservation planning, and regional science.

Library Resources. The department has one of the finest planning libraries in the world, with a collection of books and reports developed during the more than seventy-five years that planning education has been offered at this university.

Computing Resources. The department has an instructional computing laboratory with sophisticated, graphic workstations to support planning decision making.

VETERINARY MEDICAL SCIENCE

Dean of the College of Veterinary Medicine: Victor E. Valli

The College of Veterinary Medicine has realigned the administration of its graduate programs from a single program (veterinary medical science) to three programs corresponding to the academic departments in the college (veterinary biosciences, veterinary clinical medicine, and veterinary pathobiology). Graduate students are admitted directly to one of the three academic department programs.

Veterinary Biosciences

Head of the Department: William C. Wagner

Correspondence and Information: Department of Veterinary Biosciences, University of Illinois at Urbana-Champaign, 3516 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.F. Bevill, W.B. Buck, L.E. Davis, L.G. Hansen, J.E. Hixon, G.L. Jackson, R.F. Keeler, G.D. Koritz, M. Manohar, R.S. Ott, A.J. Parker, J.L. Shupe, E. Small, C.W. Smith, J.C. Thurmon, M.E. Tumbleson, A.R. Twardock, W.C. Wagner, H.L. Whitmore

Associate Professors: V.R. Beasley, A.S. Hassan, K.R. Holmes, T.F. Lock, G.J. Pijanowski, M.R. Simon

Assistant Professors: L. Abbott, M. Chambers, P.S. Cooke, J.C. Eurell, T.E. Eurell, G. Iwamoto, E.H. Jeffery

Graduate Degree Programs. The Department of Veterinary Biosciences offers graduate work leading to the degrees of master of science and doctor of philosophy. Areas of specialization include anatomy, bioengineering, physiology, pharmacology toxicology, and nuclear medicine. Each area has a core of required courses supplemented by other courses within the Department of Veterinary Biosciences and from other departments of the Graduate College. Laboratory and animal holding space is provided in the Basic Sciences Building, Veterinary Teaching Hospitals, and the Veterinary Research Farm.

Admission. Applicants for graduate study in veterinary biosciences must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the DVM degree or on the entire professional curriculum for those with the DVM degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional records. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of graduate credit, of which 4 units must be in veterinary biosciences and a minimum of 3 units must be in courses at the 400 level; (2) ¼ unit of veterinary biosciences seminar credit; (3) a thesis on original research; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree include: (1) 24 units of graduate credit, 12 units of which, including thesis research, must be in veterinary biosciences and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary biosciences seminar credit; (3) a reading proficiency in one foreign language; (4) passage of a departmental qualifying examination; (5) passage of the preliminary examination; and (6) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of research and teaching assistantships or associate positions are available.

Veterinary Clinical Medicine

Head of the Department: Erwin Small

Correspondence and Information: Department of Veterinary Clinical Medicine, University of Illinois at Urbana-Champaign, 242 Small Animal Clinic, 1008 West Hazelwood Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.J. Baker, G.J. Benson, B.O. Brodie, L.E. Davis, J.L. Dorner, L.C. Helper, T.F. Lock, D.R. Nelson, R.S. Ott, A.J. Parker, E. Small, C.W. Smith, J.C. Thurmon, A.R. Twardock, H.L. Whitmore

Associate Professors: A.H. Brightman, T.J. Burke, K.L. Campbell, J.A. DiPietro, W.E. Hoffmann, A.L. Johnson, S.K. Kneller, D.R. Krawiec, J.M. Losonsky, B.C. McKiernan, W.J. Tranquilli

Assistant Professors: R.R. Badertscher, D.P. Bane, M.J. Boero, J.H. Foreman, P.A. Gerding, T.E. Goetz, W.F. Hall, D.M. MacCoy, D.J. McKenna, S.A. McLaughlin, D.A. O'Keefe, G.C. Petersen, D.D. Sisson, R.D. Smith, L.G. Wheaton

Graduate Degree Program. The Department of Veterinary Clinical Medicine offers a graduate program leading to the master of science degree. The primary goal of graduate programs in veterinary clinical medicine is to prepare students for careers involving research and/or teaching in a specialty area. Graduate work in veterinary clinical medicine may be pursued in several areas including anesthesiology, equine medicine, equine surgery, food animal medicine and surgery, ophthalmology, radiology, small animal medicine, small animal surgery, swine medicine, and theriogenology (animal reproduction). The department, with the teaching hospital, has facilities and equipment for studies of clinical aspects of diseases and other conditions in domestic species.

The primary goal of graduate study programs in veterinary clinical medicine is to prepare students for careers involving research and/or teaching in a specialty clinical area. After completing graduate work, the student will be able to conduct research both independently and as a team member. Adequate training in planning research projects and writing research proposals will give the student the ability to function with teams of scientists from various areas of the biomedical field. The student's experience in clinical teaching and literature study will form the basis for the student's development of teaching programs within his or her discipline.

A residency program, designed to train a veterinarian for specialty clinical practice, can be combined with the graduate program. While a graduate program can be accomplished in a shorter time period, the duration of combined programs is usually three years, reflecting the time required to satisfy the objective of each program. Details of the residency program can be obtained from the head of the Department of Veterinary Clinical Medicine.

Admission. Admission requirements include a Doctor of Veterinary Medicine (DVM) degree or equivalent. By petition, non-DVMs could be admitted. Applicants for graduate study in veterinary clinical medicine must have a minimum grade-point average of 4.0 (A = 5.0). Admission averages are computed from the entire professional curriculum or from the last 60 hours of undergraduate studies for those without the DVM degree. Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on limited status on the basis of individual merit. Applicants who have a prior graduate degree or who have completed some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional records. Acceptance of students must be approved by the department's Graduate Committee.

Master of Science. The master's degree in veterinary clinical medicine includes completion of a thesis that conforms to VCM requirements.

The credit requirements for the master's degree are in accordance with those of the Graduate College. The minimum is 8 units, no more than 3 units of thesis credit may be included in any 8-unit program. At least 3 units must be in 400-level courses (exclusive of 499 and 490) and 2 of the 3 units must be in the student's major field of study. To maintain good standing in a graduate program, a student must have a cumulative grade-point average of at least 4.0 (A = 5.0). One statistics course is required.

The candidate must complete all requirements of the department and the Graduate College and pass the stipulated examinations. The final MS examination will consists of a presentation of the dissertation in the form of a departmental seminar (VCM 490). The seminar will be followed by an oral examination administered by the candidates committee and the department head. The ultimate criterion for recommending granting of the MS degree is demonstrated ability to design and conduct independent research.

Financial Aid. A limited number of teaching associate positions are available.

Veterinary Pathobiology

Head of the Department: Kenneth S. Todd, Jr.

Correspondence and Information: Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2522 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L.G. Biehl, J.L. Dorner, H.A. Reynolds, D. Segre, R.D. Smith, K.S. Todd, Jr., D.N. Tripathy

Associate Professors: R. DoCampo, H.B. Gelberg, E.C. Hahn, W.M. Haschek-Hock, W.E. Hoffmann, R.E. Isaacson, M.S. Kuhlenschmidt, M. Segre, A.R. Smith, J.F. Zachary

Assistant Professors: L.L. Hungerford, C.J. Jones, I. Kakoma, U.D. Kitron, G.L. McLaughlin, R. Murnane, R.K. Sanecki, G. Scherba, S.Z. Shapiro, D.A. Stahl, E.R. Vimr, M.A. Wallig, R.M. Weigel, H.E. Whiteley, F.A. Zuckerman

Graduate Degree Programs. The Department of Veterinary Pathobiology offers graduate work leading to the degrees of master of science and doctor of philosophy. Areas of specialization include epidemiology, immunology, microbiology, parasitology, clinical pathology, and pathology. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Pathobiology and from other departments of the Graduate College.

Admission. Applicants for graduate study in veterinary pathobiology must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the DVM degree or on the entire professional curriculum for those with the DVM degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Master of Science. The requirements for the degree are: (1) 8 units of credit, of which 4 units must be in veterinary pathobiology and a minimum of 3 units must be in courses at the 400 level; (2) ¼ unit of veterinary pathobiology seminar credit; (3) a thesis on original research or a publishable manuscript; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree are (1) 24 units of credit (8 units toward the PhD degree are allowed for an MS degree completed elsewhere), 12 units of which (including thesis research) must be in the Department of Veterinary Pathobiology and 6 units of which must be in other departments of the Graduate College; (2) ½ unit of veterinary pathobiology seminar credit; (3) reading proficiency in either French, German, Russian, or Spanish (other languages may be approved by petition); (4) passage of the preliminary examination; and (5) a satisfactory original thesis and defense of the thesis in a final examination.

Financial Aid. A limited number of teaching and research assistantships or associate positions are available.

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Where to Write or Telephone for Information about:

GRADUATE ADMISSIONS INFORMATION AND APPLICATIONS: Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820, (217) 333-0035, or the prospective department. For foreign students: International Admissions, University of Illinois at Urbana-Champaign, 10 Henry Administration Building, 506 South Wright Street, Urbana, IL 61801, (217) 333-0413.

FELLOWSHIPS, ASSISTANTSHIPS, AND OTHER FINANCIAL ASSISTANCE: The prospective department or the Fellowship Office, Graduate College, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820, (217) 333-0036.

FINANCIAL ASSISTANCE AND STUDENT EMPLOYMENT: Office of Student Financial Aid, University of Illinois at Urbana-Champaign, Fourth Floor, Turner Student Services Building, 610 East John Street, Champaign, IL 61820, (217) 333-0100.

HOUSING: University Residence Halls, University of Illinois at Urbana-Champaign, 200 Clark Hall, 1203 South Fourth Street, Champaign, IL 61820. Housing Information, University of Illinois at Urbana-Champaign, 2 Turner Student Services Building, 610 East John Street, Champaign, IL 61820, (217) 333-1420.

INTERNATIONAL STUDENTS (general advice and counseling, including immigration-related concerns): Office of International Student Affairs, University of Illinois at Urbana-Champaign, 510 East Daniel Street, Champaign, IL 61820, (217) 333-1303.

MINORITY STUDENT AFFAIRS: Minority Students Affairs, University of Illinois at Urbana-Champaign, 130 Turner Students Services Building, 610 East John Street, Champaign, IL 61820, (217) 333-0054.

MOTOR VEHICLE AND BICYCLE REGISTRATION: Campus Parking, University of Illinois at Urbana-Champaign, 505 East Green Street, Champaign, IL 61820, (217) 333-3530.

STUDENTS WITH DISABILITIES: Rehabilitation Education Services, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, IL 61820, (217) 333-4602.

VETERANS' EDUCATIONAL BENEFITS: Veterans Educational Benefits, University of Illinois at Urbana-Champaign, 420 Turner Student Services Building, 610 East John Street, Champaign, IL 61820, (217) 333-0100.

GENERAL INFORMATION: Campus Information Desk, University of Illinois at Urbana-Champaign, 115 Illini Union, 1401 West Green Street, Urbana, IL 61801, (217) 333-INFO.

OTHER INFORMATION: Public Affairs, University of Illinois at Urbana-Champaign, Swanlund Administration Building, 601 East John Street, Champaign, IL 61820, (217) 333-5010.

Reference copies of this publication are available at Illinois public libraries, high schools, and community colleges. Copies of the *Undergraduate Programs, Graduate Programs,* and *Courses* catalogs (the latter briefly describes the content of each course, credit offered, and enrollment requirements) may be purchased at or ordered by mail from the Illini Union Bookstore, 715 South Wright Street, Champaign, IL 61820.

GRADUATE PROGRAMS

1992-94

University of Illinois
at Urbana-Champaign

University of Illinois administrative offices at Urbana-Champaign are open Monday through Friday from 8:00 a.m. to 12:00 noon and 1:00 to 5:00 p.m., except on all-campus holidays which are indicated in the University Calendar.

An information center, available to visitors to the campus, is located in the north entrance lobby of the Illini Union. The center is open from 8:00 a.m. to 8:00 p.m. Monday through Saturday and 10:00 a.m. to 6:00 p.m. on Sunday, when classes are in session.

Small group information sessions about the campus are available at the Campus Visitor's Center in Levis Faculty Center, 919 West Illinois Street. Visitors are welcome between 9:00 a.m. and 4:00 p.m., Monday through Friday, excluding campus holidays.

The commitment of the University to the most fundamental principles of academic freedom, equality of opportunity, and human dignity requires that decisions involving students and employees be based on individual merit and be free from invidious discrimination in all its forms, whether or not specifically prohibited by law.

The policy of the University of Illinois is to comply with all federal and state nondiscrimination, equal opportunity, and affirmative action laws, orders, and regulations. The University of Illinois will not discriminate against any person because of race, color, religion, sex, national origin, ancestry, age, marital status, disability, unfavorable discharge from the military, or status as a disabled veteran or a veteran of the Vietnam era. This nondiscrimination policy applies to admissions, employment, access to and treatment in the University programs and activities.

Among the forms of invidious discrimination prohibited by University policy but not law is sexual orientation. Complaints of invidious discrimination based solely upon policy are to be resolved within existing University procedures. As of the printing of this catalog, all Military Science and Air Force Aerospace Studies leadership laboratory courses are out of compliance with the University's policy of nondiscrimination based on sexual orientation.

For additional information on the equal opportunity and affirmative action policies of the University, please contact on the Urbana-Champaign campus: Joseph H. Smith, associate chancellor and director of affirmative action (and Title IX and 504 Coordinator), Swanlund Administration Building, 601 East John Street, Champaign, IL 61820, (217) 333-0574.

Information contained herein is for informational purposes only and is subject to change without notice. Individual departments and units should be contacted for further information. Courses, faculty assignments, prerequisites, graduation or completion requirements, standards, tuition and fees, and programs may be changed from time to time. Courses are not necessarily offered each semester or each year. The University retains the exclusive right to judge academic proficiency and may decline to award any degree, certificate, or other evidence of successful completion of a program, curriculum, or course of instruction based thereupon. While some academic programs described herein are designed for the purposes of qualifying students for registration, certification, or licensure in a profession, successful completion of any such program in no way assures registration, certification, or licensure by an agency other than the University of Illinois.

GRADUATE PROGRAMS

1992-94

University of Illinois
at Urbana-Champaign

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In addition to the above, there are two nonvoting student members elected annually.

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Graduate College
1992-93 Academic Calendar

This calendar will be revised periodically (twice a year) to include the current term and two or three subsequent terms. Some dates in this calendar are presently under review and, therefore, are subject to change. Please consult your graduate adviser or the Graduate College Records Office at B3 North Coble Hall, 801 South Wright Street, Champaign, IL 61820.

After degree requirements have been satisfied and the thesis has been deposited, the Graduate College will issue, at the request of the student, an official statement certifying that all requirements have been met and that the degree will be awarded at the next conferral date.

INTERSESSION 1992

Course selection and sectioning ..... April 9-23
Completion of course selection, sectioning, and registration ..... May 11-15
Instruction begins ..... May 18
Late registration begins ..... May 18
Memorial Day (all-campus holiday) ..... May 25
Instructions ends ..... June 12
Latest date to—
receive refund of tuition and fees (except nonrefundable portion) if—
withdrawing from Intersession ..... May 19, 5 p.m.
reducing credit range ..... May 19, 5 p.m.
add a course ..... May 22, 5 p.m.
drop a course without course(s) appearing on transcript ..... May 29, 5 p.m.
elect the credit-no credit grading option *or*
change the credit-no credit option to a regular grade basis ..... May 29, 5 p.m.
withdraw from Intersession without courses appearing on transcript ..... May 29, 5 p.m.

SUMMER SESSION 1992

Advance enrollment ..... April 23-May 1
On-campus registration ..... June 10-11
Instruction begins ..... June 15
Postregistration begins ..... June 15
Postregistration ends ..... June 23, noon
Independence Day observed (all-campus holiday) ..... July 3
Second half-session courses begin ..... July 13
Instruction ends ..... August 5
Reading day ..... August 6
Final examinations ..... August 7-8
August Graduation (no commencement exercise) ..... August 10
Earliest date to withdraw from eight-week courses for military service and receive—
one-half credit ..... July 13
full credit ..... July 27
Latest date to—
pay registration charges without penalty if registered by—
June 19 ..... June 23, noon
June 26 ..... June 29
June 29 or later ..... 4 p.m., day of registration

receive refund of tuition and fees (except nonrefundable portion) if—
withdrawing from first half-session courses ..... June 23
withdrawing from eight-week courses ..... June 23
withdrawing from second half-session courses ..... July 17
reducing credit range in first half-session courses ..... June 23
reducing credit range in eight-week courses ..... June 23
reducing credit range in second half-session courses ..... July 17
add a course for—
first half-session courses ..... June 24
eight-week session courses ..... June 24
second half-session courses ..... July 22
drop a course for—
first half-session courses ..... July 1
eight-week session courses ..... July 24
second half-session courses ..... July 29
add names to the August graduation list ..... July 6
elect the credit-no credit option *or*
change the credit-no credit option to a regular grade basis for—
first half-session courses ..... July 1
eight-week session courses ..... July 24
second half-session courses ..... July 29
deposit theses in the Graduate College for candidates for
master's degree in August ..... July 28

FALL SEMESTER 1992

Advance enrollment for continuing students ..... April 8-15
On-campus registration in the Armory (except for part-time nondegree)
[See order of registration in front of the *Timetable*] ..... August 24-25
Instruction begins ..... August 27
Late Registration and postregistration services begin ..... August 27
Registration for part-time nondegree students ..... September 1-11, noon
Labor Day (all-campus holiday) ..... September 7
Postregistration services end ..... September 11, noon
October Graduation (no commencement exercise) ..... October 15
Second half-session courses begin ..... October 22
Advance enrollment for spring 1993 ..... November 4-11
Thanksgiving (all-campus holiday) ..... November 26-27
Instruction ends ..... December 11
Reading day ..... December 12
Final examinations ..... December 14-19
January Graduation (no commencement exercise) ..... January 15
Earliest date to withdraw from fall semester for military service and receive—
one-half credit (seven weeks completed) ..... October 15
full credit (twelve weeks completed) ..... November 19
Latest date to—
pay registration charges without penalty if registered by—
September 4 ..... September 11, noon
September 11 ..... September 14
September 14 or later ..... 4 p.m., day of registration
receive refund of tuition fees (except nonrefundable portion) if—
withdrawing from the fall semester ..... September 11
reducing credit range for sixteen-week courses ..... September 11
reducing credit range for second-half session courses ..... October 28

add a course for—
- first five-week courses ..... September 4
- first half-session courses ..... September 17
- sixteen-week courses ..... October 5
- second five-week courses ..... October 9
- eleven-week courses ..... October 16
- second half-session courses ..... November 11
- third five-week courses ..... November 20

drop a course for—
- first five-week courses ..... September 16
- first half-session courses ..... September 30
- second five-week courses ..... October 20
- eleven-week courses ..... October 27
- sixteen-week courses ..... November 20
- second half-session courses ..... November 25

elect the credit-no credit grading option *or*
change the credit-no credit option to a regular grade basis for—
- first five-week courses ..... September 16
- first half-session courses ..... September 30
- second five-week courses ..... October 20
- eleven-week courses ..... October 27
- sixteen-week courses ..... November 20
- second half-session courses ..... November 25

remove an Ex grade received in the previous semester or summer session to avoid receiving an E by rule ..... December 11

add names to the—
- October Graduation list ..... September 11
- January Graduation list ..... November 9

take the final examination for the doctoral degree in—
- October ..... September 14
- January ..... December 7

deposit theses in the Graduate College for—
- master's degree in October ..... September 23
- doctoral degree in October ..... September 30
- master's degree in January ..... December 14
- doctoral degree in January ..... December 18

SPRING SEMESTER 1993

On-campus registration ..... January 11-12, 5 p.m.
Instruction begins ..... January 14
Martin Luther King, Jr. Day (all-campus holiday) ..... January 18
Spring vacation ..... March 6-March 14
Instruction resumes ..... March 15
Last day of instruction ..... May 5
Reading day ..... May 6
Final examinations ..... May 7-15
Commencement ..... May 16

INTERSESSION 1993

Instruction begins ..... May 17
Memorial Day (all-campus holiday) ..... May 31

Graduate Studies at the University of Illinois at Urbana-Champaign

The University of Illinois at Urbana-Champaign is a leading center for graduate education in the nation. A distinguished graduate faculty of approximately 2,200 members supervises and guides graduate students in research, scholarship, and teaching.

The faculty members of the Graduate College are among the University's most active scholars. These men and women, who have national or international stature as leaders in their fields, work closely with graduate students. More than seventy-four faculty members have been elected to the American Academy of Arts and Sciences, the National Academy of Sciences, or the National Academy of Engineering. Ten scientists have received the National Medal of Science while on the faculty. Fifty-six faculty members have received the Presidential Young Investigators Award since it was established by Congress in 1984 to support research by outstanding faculty members near the beginning of their academic careers.

The University is the home of numerous national centers conducting research across many disciplines, including supercomputing, engineering, education, genetics, and the arts.

The Graduate College is an administrative unit that has jurisdiction over all programs leading to advanced degrees. The Graduate College develops and safeguards standards of graduate work and promotes and assists research by faculty members and graduate students in all fields.

The University of Illinois was founded in 1867 as the land grant institution of the state of Illinois. In the 125 years since its founding, the University has become an institution of international stature. Scholars and educators rank it among the world's great universities. It is recognized for the excellence of its academic programs and its research, as well as for the outstanding facilities and resources available to students and faculty.

GRADUATE DEGREES

The University of Illinois at Urbana-Champaign enrolls approximately 9,800 graduate and professional students and offers advanced degrees in more than 100 fields of study. In addition to the MA or MS and PhD degrees offered in many disciplines, a number of departments offer work leading to other graduate degrees. Among these are master's and doctoral degrees in professional and performing arts fields and various master's degrees in teaching.

Descriptions of these degrees are given in the appropriate departmental sections of this *Graduate Programs* catalog. More detailed descriptions of graduate programs and the requirements for the degrees may be obtained from the individual departments.

Research and Instructional Resources for Graduate Students

The University of Illinois at Urbana-Champaign is a comprehensive graduate institution. A distinguished graduate faculty, outstanding research facilities, one of the top-ranked libraries in the nation, and superior computer facilities make the Urbana-Champaign campus a stimulating environment for graduate study and research.

The following pages describe some of the facilities and resources available to graduate students and faculty in ten broad fields of graduate study—agriculture, applied life studies, commerce and business administration, communications, education, engineering, fine and applied arts, law, liberal arts and sciences, and veterinary medicine. The instructional and research programs of individual departments and of interdisciplinary and other graduate units are described in the Programs of Study section of this catalog.

UNIVERSITY LIBRARY

The University Library's resources for advanced study and research are exceptional. It is the third largest academic collection in the nation, housing more than 13 million items, including more than 7.5 million volumes, 515,000 pamphlets, 600,000 maps and aerial photographs, 1 million music scores and parts, and 3.7 million microtexts. In addition, the library receives more than 94,000 periodicals, serials, and newspapers. This wealth of material is housed in the Main Library (with 4.1 million volumes in the book stacks) and thirty-eight departmental libraries at various locations across the campus.

Outstanding collections have been developed in many areas. Collections in the humanities include classical literature and archaeology, English literature of the sixteenth through the twentieth centuries, Romance and Slavic literature, German literature of the sixteenth and seventeenth centuries, American humor and folklore, and comparative philology. Collections in the fine arts include architecture, landscape architecture, and music. Subjects of social sciences collections include history of the western United States, Abraham Lincoln and the Civil War, Latin America of the Revolutionary period, the Slavic countries, Ireland, medieval and modern Europe, international law, labor and industrial relations, and political science. Subjects in the sciences and technology collections include agriculture; biological sciences, especially entomology, ornithology, and parasitology; chemistry; geology; mathematics; and physics.

The Rare Book and Special Collections Library houses a superior collection of more than 200,000 volumes, including more than 1,000 incunabula. The collection has three major areas of strength: English history and literature, the history of geology, and the emblem book collection. The Milton collection, the finest in the world, includes more than 400 different editions of his works published during the seventeenth and eighteenth centuries. The oldest printed book in the Rare Book and Special Collections Library is a 1455 copy of the Book of Genesis from the Gutenberg Bible; the most valuable is the Audubon Folio, on permanent display. A catalog has been published containing the Rare Book and Special Collections Library acquisitions through 1978.

The completeness of the bibliographic and reference facilities makes almost any sort of research possible. In addition, interlibrary loan service is provided for materials not available in the library.

COMPUTING AND COMMUNICATIONS SERVICES OFFICE

The Computing and Communications Services Office (CCSO) on the Urbana-Champaign campus provides computer support for instructional and research programs as well as for communications services throughout the University. CCSO supports two main operating systems, VM/CMS and UNIX, which run on IBM, CONVEX, and Sequent machines. These systems are interconnected and serve a network of remote facilities, open-access campus computer sites, networked workstations, graphics equipment, and office desktop systems, as well as dial-up access from office and residential locations. CCSO provides ongoing development and support of a campuswide network, called UICnet, based on optical fiber. Yearly campus funding continues the extension of UIUCnet to all major buildings and the construction of local area networks (LANs) within buildings.

Members of more than 100 University departments use CCSO facilities. The graduate curricula are heavily dependent on computing support, and a large percentage of thesis research requires some computer use. Approximately two-thirds of the use is related to graduate programs and research. Areas of strength include computer music, networked information management, and computer art/design, in addition to computer use in more quantitative disciplines.

Administration of computing facilities is guided by the principle that users should have easy access to computer support. Access to CCSO's systems is provided through formal allocations for courses and research and through limited free accounts for students, faculty, and staff to use electronic mail (e-mail) and access to network news and information. In addition to its own facilities, CCSO arranges access to other computing facilities within the University. CCSO also coordinates the UIUC Computer Training Center and video-conferencing services.

In order to provide easy access to computing resources, CCSO maintains public computer sites across the campus; these sites offer computer systems, software, and printing services. CCSO works with faculty, staff, and departments to provide software in support of many classes in a wide range of curricula. CCSO public sites are located in the Illini Union, Illini Hall, the Digital Computer Lab, Everitt Lab, English Building, Lincoln Hall, Oregon Street Computer site, Psychology Building, CRH Snack Bar, and Commerce West. CCSO departmental sites are located in Turner Hall, Noyes Lab, the Psychology Building, and the Undergraduate Library.

The University owns a vast array of computer resources, including microcomputers, workstations, minicomputers, mainframes, and supercomputers. This equipment is networked by UIUCnet and departmental LANs, which deliver basic services—electronic mail, file transfer, access to remote networks, access to the library card catalog, a timely weather report, the online student/staff directory, a campus information server, and several commercial databases. Hardware components based on national standards are used, providing a firm basis from which to build a ubiquitous campus network.

CCSO offers a full complement of computer-related user services through a Resource Center located in the Digital Computer Laboratory, which also houses CCSO offices and mainframe operations. User services include consulting on mainframe systems, microcomputers, software packages (including statistical and

mathematical software), hardware, e-mail, and other uses of the campus network. Consulting is offered on both a walk-in and a phone-in basis. Computer training courses and seminars are taught by the staff. The Resource Center also provides demonstration systems on which users may try various software packages or may copy free public-domain software.

CCSO operates a Network Operations Center (NOC) to monitor and support the campus network. A Network Design Office (NDO) coordinates the connection of buildings to UIUCnet and assists the departments with LAN designs. Recognizing the distributed nature of campus computing, CCSO offers a Computer Consultant Support Program (CCSP) to provide training and supportive contracts for the human network of departmental computer consultants.

The long tradition of employing computing technology in research and teaching at Illinois has led to the strength of computing resources both within CCSO and across the campus.

CIC TRAVELING SCHOLAR PROGRAM

The Committee on Institutional Cooperation (CIC), a consortium of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to attend other CIC institutions in order to take advantage of special course offerings, laboratory facilities, or library collections. Visits of traveling scholars are limited to two semesters or three quarters. Traveling scholars register and pay regular fees at their home universities. Credit earned while in this program is automatically accepted by the home university.

Application forms are available from the Records Office, Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820.

INTERNATIONAL PROGRAMS AND STUDIES

The University of Illinois at Urbana-Champaign offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate study and research often form an integral part of University programs with foreign institutions. Research opportunities are available through many departments; the Graduate College; the Center for African Studies; the Center for East Asian and Pacific Studies; the Center for Latin American and Caribbean Studies; the Center for Russian and East Europeans Studies; the Program in South and West Asian Studies; the Program in Arms Control, Disarmament, and International Security; and the Office of Women in International Development.

For full information on these opportunities, as well as other graduate study-abroad programs and a wide range of courses and seminars in international studies, write for the handbook *International Programs and Activities*, obtainable from International Programs and Studies, 303 International Studies Building, 910 South Fifth Street, Champaign, IL 61820, or contact the appropriate college or department.

In addition, overseas teaching opportunities are often available in music education, English as an international language, and some of the modern language departments. Interested students should consult the executive officer of the appropriate department or division.

RESEARCH SERVICES OFFICE

Resources of the Research Services Office (RSO) are designed to support research and scholarship activities at the University of Illinois at Urbana-Champaign. Resources and services of the office are available to faculty, staff, and students.

The IRIS database of sponsored opportunities identifies potential sponsors that fund research, teaching, travel, equipment purchases, advanced study, and other activities. Developed at the University of Illinois, IRIS has more than 6,000 opportunities that support such activities. Nationwide, more than 100 institutions use IRIS.

Current literature on these sponsored opportunities is available through RSO and covers major federal agencies, less well-known federal agencies, foundations, corporations, professional societies and associations, universities, libraries, and institutes. *Research Report* is a biweekly newsletter containing information on select funding opportunities. Seminars and workshops are offered to give faculty members an opportunity to work with their peers and with a professional grantswriter on the principles of proposal writing.

Reference materials on research-related topics that are available in RSO cover commercial resource books on sponsors, federal agency program guidelines and telephone directories, grant listings for major federal agencies, peer review and funding trends reports, proposal budget preparation, proposal writing, sponsor funding identification and analysis, and university compliance regulations.

BECKMAN INSTITUTE FOR ADVANCED SCIENCE AND TECHNOLOGY

The Beckman Institute for Advanced Science and Technology is considered the largest and most ambitious university-based multidisciplinary research facility in the United States. It was founded on the premise that reducing the barriers between traditional scientific and technological disciplines can yield research advances that more conventional approaches cannot.

The research conducted within the Beckman Institute is organized along two parallel lines examining living and nonliving systems of increasing complexity. One focus incorporates research in the areas of biology, behavior, and cognition. The other concentrates on the physical sciences, computation, and engineering. Within the life and behavioral sciences, programs extend from biochemical, molecular, and cellular level studies of how neurons work, through integrative and computational neuroscience, to cognitive science, which seeks to understand how humans process sensory information and knowledge. In the physical sciences and engineering, programs range from efforts to synthesize and characterize new materials with potential as information-processing devices, through computational simulation of advanced electronic devices and modeling of complex systems, to artificial intelligence.

Twenty Beckman Institute research groups, composed of researchers from nearly two dozen UIUC departments as far-ranging as psychology, computer science, and biochemistry are investigating these and other areas. A $40 million grant from alumnus Arnold O. Beckman and his wife, Mabel M. Beckman, provided funding for the building. The state of Illinois supplemented that gift and also provides the ongoing operating support for the facility. The research programs in the building are supported mainly by external funding from the federal government and from corporations and foundations.

BIOTECHNOLOGY CENTER

The Biotechnology Center, a special unit of the Graduate College, is an organization of more than 100 faculty members of the Urbana-Champaign campus from more than a dozen departments that have active research programs spanning a broad range of biotechnology research areas. The center supports an expanding industrial-affiliates program that promotes interaction between the faculty and scientists in industrial research settings.

The Biotechnology Center administers five centralized service facilities: the Genetic Engineering Facility, the Cell Science Laboratory, the Molecular Graphics Facility, the Fermentation Facility, and the Transgenic Animal Facility. The Genetic Engineering Facility synthesizes peptides and DNA oligonucleotides and performs protein sequencing and amino acid analysis for faculty members and for industrial affiliates. The Cell Science Laboratory has a hybridoma facility for making monoclonal, antibody-producing cell lines and a flow cytometry facility with three state-of-the-art fluorescence-activated cell sorters. The flow cytometers are available to all faculty members and graduate students for use in conjunction with their research efforts. A full-time operator is available to run samples and to train staff members in the use of these sophisticated instruments. The Molecular Graphics Facility has four Silicon Graphics Iris workstations with several sophisticated software programs for the display and manipulation of macromolecules. The Fermentation Facility is supervised by a trained chemical engineer who operates 20-, 30- and 200-liter fermenters for the growth of large quantities of microorganisms. The Transgenic Animal Facility, jointly supported with the College of Agriculture, is available to help faculty members test gene constructs in transgenic mice.

The Biotechnology Center supports interdisciplinary graduate courses and workshops in biotechnology and organizes an annual conference on biotechnology research each spring on the Urbana-Champaign campus.

COMPUTER-BASED EDUCATION RESEARCH LABORATORY

Begun in 1960, a unique computer-based educational system has been developed at the Computer-based Education Research Laboratory (CERL) on the Urbana-Champaign campus. The system, originally named PLATO®, is an interactive, time-sharing system whose computers control hundreds of terminals throughout the country. The original CERL PLATO® system is no longer operating, but it has been replaced by NovaNET®, a new super-sized, more affordable version with an extensive communications network. NovaNET® offers innovative technical features such as high-speed, low-cost, central processors capable of handling several thousand terminals per system, and a variety of communications options to meet user needs, including satellite data transmission and access to local and national networks.

CERL has cooperated with faculty members in many departments who have wished to develop courseware for the system and to incorporate it in their instruction. As of December 1991, more than 21 million user-service hours have been delivered on the PLATO® system since 1978, and more than 2.3 million user-service hours had been delivered on NovaNET® since it became operational in 1987.

Students at the University of Illinois have access to NovaNET® through designated NovaNET® classrooms in various buildings around campus, through general microcomputer sites maintained by the Computing and Communication Services Office, through the campus network available in almost every building, including

dormitories, and by dial-up from homes and offices. Lessons are available in more than one hundred academic disciplines. NovaNET® also plays a role in the recreational life of the campus, providing a variety of interesting, educational games.

CERL is responsible for operating a system that provides almost two million hours of student and author use per year. In addition, the laboratory provides opportunities for research in the design and development of new hardware and software and in applying commercial hardware, software, and communications offerings to educational uses. Research on and development of courseware is always of interest.

In addition to the system located at CERL, there are PLATO® systems elsewhere in the United States and worldwide. Lessons are transferable from one system to another. The courseware is written in TUTOR, a powerful and efficient language created for and at CERL, which allows text and graphic designing, programming, and testing of lesson material by the authors directly at their terminals.

PROGRAM FOR THE STUDY OF CULTURAL VALUES AND ETHICS

The Program for the Study of Cultural Values and Ethics is an interdisciplinary unit for the advancement of inquiry in the humanities, social sciences, and arts. The program serves to help faculty members support research, develop courses, and conduct conferences in areas that relate to the evolution, understanding, and implementation of cultural values and ethical systems. UIUC faculty members may apply to the institute and be appointed for terms of from one semester to three years for interdisciplinary activities relating to the study of cultural values and ethics. The program provides several research assistantships and fellowships to graduate students who wish to pursue research in these areas. Activities of the program also include seminars, short courses, and artistic projects. The program plans to publish lectures, books, articles, reports, and a journal.

MICROELECTRONICS LABORATORY

The Microelectronics Laboratory is a multidisciplinary facility in the College of Engineering for investigating new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors. Within the laboratory, the National Science Foundation-sponsored Engineering Research Center for Compound Semiconductor Microelectronics (CCSM), with its research, educational, and industrial outreach programs, focuses on the investigation of optical interconnect technologies to eliminate the bottleneck of metal interconnects in high-speed digital systems, with the special goal of triggering the development of new technologies by industry. The crossdisciplinary program is aimed not only at research, but also at the education of undergraduate and graduate students in the most advanced concepts and practices in microelectronics.

The laboratory includes four special groups of facilities: those for artificially structured materials, including MBE and MOCVD epitaxial growth; those for submicron device fabrication, including electron beam and optical lithography, plasma-assisted deposition of oxides and nitrides, reactive ion etching, and plasma etching; a facility for ultra-high-speed optical and electrical measurements; and facilities for characterization of ultra-high purity semiconductors.

A new Microelectronics Laboratory building was completed in 1989 to house the

CCSM. Funded by the state of Illinois, the $13.5 million, 50,000 square-foot building includes state-of-the-art clean-room space for crystal growth, fabrication, and semiconductor device processing, as well as general-purpose laboratories and offices. The building is the first university facility in the world to be built in accordance with the H6 fire and safety codes applicable to semiconductor laboratories. The clean-room area, which consists of 8,000 square feet of clean-room space, is in an isolated, reinforced concrete enclosure that is vibrationally tuned to a limit of 10-20 microinches at any frequency.

NATIONAL CENTER FOR SUPERCOMPUTING APPLICATIONS

The National Center for Supercomputing Applications (NCSA), a special unit of the Graduate College, is one of four centers funded by the National Science Foundation (NSF) in February 1985 to start a new national supercomputing program for university researchers.

NCSA has developed a comprehensive computational environment, currently centered on four supercomputers (a CRAY YMP, a CRAY-2, a Connection Machine CM-2, and a Convex C 3880) to support the research and educational needs of the national research community. Allocations on the NCSA systems are awarded by peer review. Graduate students can gain access through their advisers or through a group that has been allocated time on the system.

NSF placed the new national centers at major research universities to provide fertile ground for the multidisciplinary exchanges needed to create new fields in computational science. The University of Illinois at Urbana-Champaign founded an Interdisciplinary Research Program (IRP) within NCSA to focus this process. IRP is a new type of scientific program built around a comprehensive, integrated computational network that facilitates frontier research and the sharing of knowledge across disciplines. During the spring of 1989, IRP expanded its operations into the new Beckman Institute. IRP supports a variety of intellectual programs involving national visitors; staff research scientists; University of Illinois adjunct faculty and postdoctoral, graduate, and undergraduate students; computer scientists; and computer professionals.

NCSA does not directly fund research projects, but provides the environment in which they can be carried out effectively. The center is a training ground for graduate students working on IRP-affiliated projects. Training includes the use of supercomputers, workstations, and productivity software for research purposes. In addition, NCSA sponsors many educational activities, such as seminars and technology demonstrations, which are open to the entire University community.

NCSA's approach is to develop a computing system based on proven technologies while providing an upgrade path to maintain a state-of-the-art system. To provide researchers with faster, more reliable access to their files, NCSA has increased both the amount of storage available and the speed at which files are transferred for center users. More than 3 terabytes of data are now stored at the NCSA Common File System (CFS) system. The Cray, Convex, and Connection Machine supercomputers, the mass storage system, and various high quality output devices are connected via a backbone network.

Software packages are supported at NCSA for most branches of science and engineering. In addition, the NCSA Software Tools Group develops software tools for computational scientists and turns prototypes into products. Its highly successful communications package, NCSA Telnet, is used by more than 20,000 researchers in

the United States and Europe. Its integrated suite of color imaging and data analysis tools is also used worldwide. Current projects include communications packages, image analysis and display, presentation tools, and distributed solutions that will more closely integrate scientists' workstations into the supercomputing environment.

The networked workstation environment of NCSA is designed to enhance research productivity and to give faculty and students experience with state-of-the-art tools and techniques in computing.

CENTER FOR THE STUDY OF READING

The Center for the Study of Reading is a multidisciplinary community of researchers and scholars who conduct basic and applied research and engage in practical programs designed to produce a better understanding of how people learn to read, how they comprehend what they read, and how they can be taught to read.

Examples of continuing programs of basic research at the center include investigations of perceptual processes in reading and children's knowledge acquisition in the content areas. Continuing applied research programs include analyses of textbooks, the development and evaluation of improved techniques for teaching reading, and children's vocabulary growth and development. The center's practical programs include the series of booklets for use by textbook adoption committees in selecting reading programs.

The center disseminates its work to educators, researchers, and others interested in reading research and education through its *Technical Reports* series and through publications such as *Becoming a Nation of Readers, 10 Ways to Help Your Children Become Better Readers, Independent Reading: Suggestions for the Classroom,* and *Beginning to Read: Thinking and Learning about Print.*

The center also sponsors an annual summer institute for teachers, Becoming a School of Readers, and an annual meeting for researchers, the Conference on Reading Research, held prior to the conference of the International Reading Association.

CENTER FOR SUPERCOMPUTING RESEARCH AND DEVELOPMENT

The Center for Supercomputing Research and Development (CSRD), established in late 1984, is a special unit of the Graduate College. CSRD is involved with advancing the state of supercomputing in three areas: (1) engineering and architecture, (2) software, and (3) algorithms and applications. The center's goal is to demonstrate that supercomputers of the future can exhibit efficient, general-purpose behavior and be easy to use. Activities are based on the algorithm, architecture, and software work conducted at the University of Illinois at Urbana-Champaign for the past fifteen years.

Basic research and development at CSRD is focused on the Cedar system, a prototype large-scale multiprocessor that is being built at the center. Cedar is being used to explore multiprocessor performance, develop software to exploit shared-memory multiprocessors effectively, and provide high performance over a wide range of applications.

In the realm of engineering and architecture, methods are being developed to construct a communication structure (switch) that can support the data transfer,

interprocessor communication, and process synchronization requirements of a large-scale multiprocessor. To support a very large number of fast processors, the communication structure must be scalable technologically and architecturally. Research will also be conducted to determine optimal methods by which the control of a multiprocessor can be fully distributed (global). A third major area of research involves the development of the most appropriate methods for synchronizing processes, processors, tasks, and computations for a variety of specific applications.

Extensive experimentation into compilation techniques for a vector/multiprocessor is continuing at CSRD. The Parafrase System, which provides automatic vectorization and multiprocessing of programs, has been implemented. Software research is also continuing in the management of cache and virtual memory in multiprocessors. Another focus of software investigation will address operating system problems, such as scheduling and queue access, that can result from the use of a large number of processors.

Numerical algorithms for solving important problems in nuclear reactor safety studies, such as obtaining energy by controlled fusion, atmospheric modeling, and hydrodynamic simulation, have taxed the capabilities of existing computers to the limit. The availability of vector machines such as the CRAY and Cyber 205 resulted in some speedup, but for many applications, it has not been substantial. At CSRD the foundation has been laid for the development of basic multiprocessor algorithms that are counterparts of well-developed and well-understood sequential algorithms. Cedar will provide the opportunity to understand the limitations of certain algorithms as the number of processor clusters increases and will assist in the development of algorithms that are more suitable for massive parallelism.

The availability of powerful new computers has made it possible to use computational methods in larger and broader areas of science and engineering. Using computers effectively becomes increasingly difficult, partly because of the complexity of these new computers and their software.

The field of computational science and engineering deals with the use of computers in solving real problems in science and engineering. All aspects of the effective use of computers are considered, including the design and implementation of more effective hardware, software, applications, and algorithms.

CENTER FOR WRITING STUDIES

The Center for Writing Studies (CWS) facilitates research and promotes graduate study in the areas of rhetoric, written composition, language, and literacy. For graduate students pursuing MA or PhD degrees in participating departments, the center offers a program leading to a specialization in writing and literacy research. Participating departments and programs include the Department of English, the Department of Speech Communication, the Division of English as an International Language, and the College of Education. Other campus units and programs with which faculty members are affiliated are the Beckman Institute, the Center for Advanced Study, the Center for the Study of Reading, the Institute for Communications Research, the Program for the Study of Cultural Values and Ethics, and the Unit for Criticism and Interpretive Theory.

The work of the center is focused around three principal areas: the historical, the theoretical, and the empirical study of writing. Specific interests include research in computers and composition studies, methods of rhetorical and functional language analysis, cognitive processes in message production, the development of language and literacy theory and policy, and problems in technical and scientific writing.

Graduate training in scholarship and research is accompanied by an equally thorough preparation for teaching. CWS is also home to *Computers and Composition*, a journal for teachers of writing, and the *CCCC Bibliography of Composition and Rhetoric*.

Research and Instructional Resources within Disciplinary Colleges

Although the Graduate College has oversight responsibility for graduate programs and degrees as well as for a number of research and service facilities, each of ten disciplinary colleges at the UIUC campus serves as an educational and administrative group composed of departments and other units. These are the Colleges of Agriculture, Applied Life Studies, Commerce and Business Administration, Communications, Education, Engineering, Fine and Applied Arts, Law, Liberal Arts and Sciences, and Veterinary Medicine. Other disciplinary units outside the colleges include the Institute of Aviation, the Institute for Environmental Studies, the Institute of Labor and Industrial Relations, the Graduate School of Library and Information Science, and the School of Social Work. Graduate students are an integral part of the research activities conducted in all of these units.

AGRICULTURE

Within the College of Agriculture, the Agricultural Experiment Station coordinates the college's research program. Approximately 10,000 acres of college-owned farmland in all parts of Illinois are used for research. Approximately 400 active projects in the Agricultural Experiment Station are being conducted on campus and at the fifteen research centers throughout the state.

Because agricultural research often involves more than one field of study, much of it is conducted in cooperation with other colleges on the Urbana-Champaign campus, with the state surveys on campus (Geological, Natural History, and Water), with the U.S. Department of Agriculture, and with other agricultural colleges. Interdisciplinary research is encouraged in such special areas as crop and animal production and uses, environmental quality, pest management, the International Soybean Program (INTSOY), and food and nutrition.

Illinois education, agriculture, and agribusiness are in the forefront of world food production and development. In addition to course offerings with an international focus, research is conducted with the goal of assisting developing countries to expand their own food production and distribution. Faculty exchanges and cooperative research with foreign institutions and agencies offer opportunities for mutually beneficial programs. The Office of International Agriculture is responsible for the broad supervision of the college's international activity. Some major international interests include soybeans, maize, animal agriculture, and nutrition.

APPLIED LIFE STUDIES

In addition to departmental research facilities within the College of Applied Life Studies, the Institute for Research on Human Development serves as an interdisciplinary research unit concerned with health and human development. The institute's work is directed toward understanding and promoting optimum health, human development, and performance. The institute has an established national reputation for its work in gerontology, motivation, psychopharmacology, performance assessment, and related areas. Its programs are characteristically undertaken in cooperation with other units such as the Department of Community Health, the Division of Human Development and Family Studies, and the Division of Rehabilitation Education.

COMMERCE AND BUSINESS ADMINISTRATION

Several activities within the College of Commerce and Business Administration supplement the research efforts of the departments. The Office for Information Management is financed jointly by a grant from the IBM Corporation, college and university funds, and other corporate donations. The major goal of the office is to coordinate the development of computer applications in the course curriculum, to supervise computer laboratories used for general student projects that simulate specialized business information system environments, and to provide a focal point for research-related information systems and their impact on management and its operations. The facilities and activities of the office permit the college to give students experience in state-of-the-art equipment and programs in information systems.

The Executive-in-Residence Program and the Chief Financial Officer Lecture Series bring visiting business executives to the campus to present lectures and lead discussions on specific topics. The Bureau of Economic and Business Research provides and analyzes a variety of state and local economic data. The college has acquired several financial data files such as the Chicago Research on Stock Prices (CRSP) and the Standard and Poor's Compustat Tapes. There are also economic data tapes, including those of the Data Resources and International Monetary Fund. The college is the depository for the Bureau of Economic Analysis tapes and diskettes.

The international orientation of many programs is another important aspect of the college's overall teaching and research program. Distinguished faculty members with international academic backgrounds have developed a number of special courses with an international focus. The Office of the Coordinator of International Programs in the college provides overall assistance in the international field. The Center for International Education and Research in Accounting in the Department of Accountancy coordinates the research programs of distinguished visiting scholars and publishes an international accounting journal. The college is involved in several overseas programs, including programs in Bangladesh, Saudi Arabia, the Sudan, and elsewhere. A Program in Policy Economics has been started in the Department of Economics for people from developing countries, and the Department of Business Administration offers a fourteen-month Master of Science in Business Administration for International Managers.

The Office of Real Estate Research, funded by the State of Illinois Real Estate Recovery Fund, undertakes and fosters research related to real estate in Illinois,

communicates the results of such research to the real estate industry, and promotes the ongoing development of real estate education.

Additional research offices have been created in the college: the Office of Public Utility Research, the Office of Accounting Research, and the Office of Business Innovation and Entrepreneurship. Each of these offices promotes and coordinates research of faculty members in the college in these specific areas. In addition, each office provides a focal point for the college and its various constituencies to discuss and disseminate research results. These offices are funded by a combination of government and private-industry support.

The Survey Research Laboratory is widely used by faculty and students interested in survey work. The Behavioral Laboratories are used to perform behavioral experiments, and the computer is a major tool for hypothesis testing and programming.

COMMUNICATIONS

In the College of Communications, the Institute of Communications Research, which administers the doctoral program in communications, is one of the oldest and most distinguished interdisciplinary research centers in the United States. Through its graduates, the institute has spawned many similar programs and institutes around the country. It conducts research and teaches in virtually all areas of communication but concentrates on cultural and media studies, the political economy of communications, the effects of mass communication, attitude and opinion change, and the psychology and sociology of language. It provides students the opportunity to study and to conduct research with a faculty that combines such disciplines as political science, sociology, psychology, and linguistics with the professional fields of advertising, broadcasting, and journalism. The University broadcasting division, which operates WILL-AM, -FM, and -TV, provides equipment and studios for broadcast instruction. The college also maintains laboratories for audio production, typography, and photography. Holdings in the Communications Library in Gregory Hall are widely regarded as among the best in the nation.

EDUCATION

In addition to research conducted principally within academic departments, the following units, with specialized research interests, are supported by the college: the Bureau of Educational Research, the Center for Instructional Research and Curriculum Evaluation, the Center for the Study of Reading, the Office of Educational Policy Research, the Office of International Programs in Education, the Office of Career Development for Special Populations, the Office of Vocational Education Research, the National Center for Research in Vocational Education/University of Illinois Office, and the Secondary Transitional Intervention Effectiveness Institute. Most of these units offer assistantships or fellowships to qualified doctoral students.

ENGINEERING

The College of Engineering, one of the original units of the University when it was founded in 1867, is recognized as a major international center of excellence in graduate education in scope, quality, and productivity. In overall quality, the college has been among the top four in the nation in all surveys of recent years. The College of Engineering leads the nation in total degrees conferred at all degree levels; in recent years, one out of every twenty PhD graduates in engineering received his or her degree from the University of Illinois at Urbana-Champaign.

The college's Experiment Station, organized in 1903 as the first of its kind, had separately budgeted research expenditures of $75.5 million in the 1988 fiscal year. Special laboratories and unusual facilities include the EpiCenter, with a seven-port molecular beam epitaxy machine, and the new Microelectronics Laboratory, with equipment for plasma-assisted deposition, reactive ion and plasma etching, and E-beam lithography. In the Center for Microanalysis of Materials, an impressive collection of instruments is available, including that for Auger, X-ray photoemission, and secondary ion-mass spectroscopy. Also available are a nuclear reactor, radio and optical telescopes, an AVCO HPL-10 20-kW industrial laser, and an 80-kW plasma spray unit.

University computer services are provided by a number of general-purpose computers: a Convex C220, IBM 3081 and 4341, a Gould, two Sequents, three Pyramids, and several VAX 11/780s. In addition to these central facilities, there are thousands of personal computers and a number of minicomputers and mainframes supported by individual departments. The college also operates an IBM 4381 for CAD/CAM applications. This vast array of computing resources is supported by a hierarchical network consisting in part of a large (2000 port) asynchronous terminal network and an optical-fiber, token-ring backbone network. The college's twenty-three major buildings are on a network that gives faculty members and students access to all central computing facilities, to the 110 attached local area networks, and to a number of regional and national networks such as ARPAnet, BITnet, and NSFnet.

The Materials Engineering Research Laboratory is an interdisciplinary laboratory with extensive equipment for the characterization of the mechanical behavior of materials. The college maintains three major interdisciplinary research laboratories: the Coordinated Science Laboratory (CSL), the Materials Research Laboratory (MRL), and the Microelectronics Laboratory. CSL provides an interdisciplinary research environment for faculty members and students from engineering and other disciplines. The research concentrates on such areas as computer systems, communications, VLSI circuits, artificial intelligence, signal processing, and robotics. MRL, with one of the country's outstanding facilities for electron microscopy and microanalysis of materials, supports research and education in the materials sciences in cooperation with a number of engineering and scientific disciplines; multidisciplinary research basic to an understanding of the solid state of matter is stressed. The Microelectronics Laboratory is a multidisciplinary facility for investigating new concepts in optical and electronic materials, devices, and systems based on gallium arsenide and other compound semiconductors.

The college has eight major federally funded centers: the U.S. Environmental Protection Agency-sponsored Advanced Environmental Control Technology Research Center; the National Science Foundation-funded Engineering Research Center for Compound Semiconductor Microelectronics; two NSF Science and

Technology Centers (cement-based materials and superconductivity); and four centers (composite materials, construction technology, cement composite materials, and supercomputing environments) funded by the Department of Defense under its University Research initiatives program.

FINE AND APPLIED ARTS

In addition to the schools and departments in the College of Fine and Applied Arts, excellent facilities are available for graduate student work. These include the Krannert Center for the Performing Arts, the Krannert Art Museum, practice rooms, studios, laboratories, exhibition spaces, and specialized libraries.

The Krannert Center for the Performing Arts provides studio space for classes in theatre, dance, and music; graduate students participate in many of the public performances in its four theatres as well as in other theatres on campus. Music students use the rehearsal rooms, studios, and auditoriums in Smith Music Hall and in the Music Building. The work of students receiving MFA degrees in the School of Art and Design is exhibited in the Krannert Art Museum, which is connected to the Art and Design Building. Students in the School of Architecture exhibit their work in the Temple Buell Architecture Gallery.

Throughout the year, many visiting artists, performers, and speakers are brought to the campus by the college and its departments. Comprehensive libraries in art and architecture, city planning and landscape architecture, and music serve students and faculty.

LIBERAL ARTS AND SCIENCES

Among the major resources and facilities for graduate students in the College of Liberal Arts and Sciences are libraries, museums, laboratories, clinical and training facilities, quantitative services, and interdisciplinary research efforts. A number of schools and departments in the college have superb departmental libraries conveniently located near the units. In particular, the libraries in chemistry, life sciences, and mathematics are exceptional. Some collections for the humanities and social sciences are outstanding, for example, the Slavic collection, the Asian Library, and the Map and Geography Library.

The Herbarium, administered by the School of Life Sciences, is the tenth largest herbarium at an American university. It is both a research and a teaching facility, and its staff serves the public by assisting in the identification of plants.

The Museum of Natural History has served graduate students and faculty members since the 1870s. A number of special collections, including reptiles, amphibians, mammals, and shells from all parts of the world, are housed in the museum. Research specimens for advanced scientific study number more than 400,000.

Two collections of special note in the humanities are the American Center of the International Photographic Archive of Papyri and the Cinema Studies Film Archive.

The World Heritage Museum houses more than 25,000 artifacts that illustrate cultural achievements from prehistoric Europe; ancient Mesopotamia, Egypt, Greece, and Rome; northern Europe; Africa; Asia; and America. The museum's collections are heavily used by University classes in history, art history, classics, and anthropology for general tours and individual research projects.

The Department of Psychology operates the Psychological Services Center, which is the principal facility for training and research in clinical psychology. The Department of Speech and Hearing Science operates three clinics (speech, language, and hearing) to provide training for its students. The Department of Astronomy, in conjunction with San Diego State University, operates a one-meter optical telescope at Mt. Laguna in California for training and research purposes; in addition, the department arranges observation time for students on both optical and radio telescopes at other sites.

All of the units in the life sciences, the physical sciences, psychology, and speech and hearing science have extensive laboratory facilities. There are also two outstanding laboratories in the humanities and social sciences: the Language Learning Laboratory and the Spatial Data Analysis Laboratory in the Department of Geography.

Also of particular note are the facilities of the School of Chemical Sciences, which include molecular spectroscopy, mass spectroscopy, and laser spectroscopy laboratories; a radioisotope laboratory; a computer center; a microanalytical laboratory; hydrogenation and high- pressure facilities; and machine, electronic, electrical, and glass-blowing shops.

The Language Learning Laboratory (LLL), in addition to providing teaching facilities, promotes research in language learning and teaching. Advanced technological resources, including PLATO®, CYBER, microcomputers, and television production facilities are available for the LLL.

The Writers' Workshop is a tutorial facility dedicated to the improvement of writing on campus at all levels. Administered by the Center for Writing Studies, the workshop offers writing assistance and advice to students enrolled in any course offered at the University. The workshop is staffed entirely by graduate students with expertise in writing, and graduate students working on theses and dissertations are among its most regular clients.

The Spatial Data Analysis Laboratory, which is administered by the Department of Geography, is responsible for developing and improving research and instruction related to the acquisition, analysis, and display of spatial data. Technical service facilities (including electronic coordinate digitizers, computer terminals, graphics terminals, darkroom photo-processing facilities, and a remote sensing and air photo laboratory) are available.

Special computing resources are available in many departments in the college; in addition, all units on campus have access to the Computing and Communications Services Office (see page 7). For example, the Department of Astronomy has direct access to the VAX 11/780 computer, shared with three other units on campus.

The Department of Statistics, through the Mathematical and Statistical Consulting Committee, provides a consulting service to faculty members and graduate students from all areas of the University. The service provides assistance in design and analysis of various statistical projects.

Units in the College of Liberal Arts and Sciences participate in a number of campuswide interdisciplinary efforts, many of which are described elsewhere in this catalog. Some of the instructional units in the college are by nature interdisciplinary. The area studies centers (African Studies, East Asian and Pacific Studies, Latin American and Caribbean Studies, and Russian and East European Studies) are examples of these; their degree programs are described in the Programs of Study section. There are two other special units: the Unit for Cinema Studies and the Unit for Criticism and Interpretive Theory.

The Unit for Cinema Studies promotes and coordinates the critical and historical study of the cinema. Its membership represents several departments and reflects various critical and scholarly interests. The unit is also a resource center that promotes cinema teaching and scholarship through its growing archive of film materials and its editorial and analytical equipment for film study.

The Unit for Criticism and Interpretive Theory, an interdisciplinary program drawing upon fifteen humanities and social science departments, promotes a broad range of teaching, research, and related scholarly activities. For MA and PhD degree students in participating departments, the unit offers a formal program leading to advanced certification in criticism and interpretive theory.

A number of other groups (some informal) of faculty and students working together on interdisciplinary studies. Examples of these are the Afro-American Academic and Research Program; the Program in Arms Control, Disarmament, and International Security; the Science, Technology, and Society Program; the Southwest Asia Studies Program; and the Women's Studies Program.

VETERINARY MEDICINE

The graduate programs in the College of Veterinary Medicine emphasize research training involving animal health, pharmacology, infectious and metabolic diseases, pathology, toxicology, zoonotic diseases, reproductive physiology, public health, neurobiology, biotechnology, comparative medicine, and bone/cartilage studies. The college has new, modern clinical and basic sciences facilities for graduate study and research ranging from basic biotechnology to applied clinical and field studies under controlled confinement and natural environmental conditions. Major emphasis is being placed on graduate training in biotechnology. Interdisciplinary research is ongoing with other colleges on the Urbana-Champaign campus and at the Dixon Springs Agricultural Center in southern Illinois. The college's association with the Illinois State Department of Agriculture, Department of Public Health, and Department of Conservation provides opportunities to use field facilities for appropriate research projects.

Facilities and Services for Graduate Students

THE CAMPUS

Located in the adjoining cities of Urbana and Champaign (population 100,000), the University and its surrounding communities offer a cultural and recreational environment ideally suited to the work of a major research institution. The University is approximately 130 miles south of Chicago, which is easily reached by air, bus, car, or rail. Ready access to major cities on both coasts through daily flights to and from the University's Willard Airport make it possible to maintain the close contact with major cultural centers that are essential to the intellectual life of an international university.

The University is a residential campus of classrooms, laboratories, libraries, residence halls, and recreational and cultural facilities with 200 major buildings on the central campus of 785 acres. Nearby are the University's 1,650-acre Willard Airport; Robert Allerton Park, the campus's 1,768-acre nature and conference center; and 3,600 acres of agricultural land. An additional 3,700 acres of farmland elsewhere in Illinois are used by the College of Agriculture as experimental fields.

Nearly every facility on campus is accessible to the physically disabled, and the University's programs and services for the disabled have served as a model worldwide.

CULTURAL RESOURCES

The University of Illinois at Urbana-Champaign is a major cultural center. Among its arts facilities is the Krannert Center for the Performing Arts, which was designed by alumnus Max Abramovitz, architect of New York City's Lincoln Center. The Krannert Center has four theatres and is a magnificent showcase for music, theatre, opera, and dance. It also has an open-air amphitheatre and five major rehearsal rooms that are used by students in professional training programs in the performing arts. More than 350 public performances are presented there each year. Internationally known performers are brought to the campus to augment the offerings of the Departments of Theatre and Dance and the School of Music.

The Krannert Art Museum has a full schedule of exhibitions, from its own collection as well as traveling exhibitions. The World Heritage Museum, which houses collections of artifacts from cities and civilizations from all parts of the world; the Museum of Natural History, which has displays on early humans, flowering and nonflowering fossil plants, animal exhibits, and more than 400,000 research specimens; and the John Philip Sousa Museum and Library are used for research, teaching, and enjoyment. Student work in architecture and related areas is exhibited in the Temple Buell Gallery. The Japan House provides members of the campus community an opportunity to experience the teaching of Japanese arts in a realistic setting.

Distinguished public figures and outstanding scholars appear regularly on campus for symposia, lectures, forums, and public discussions.

WILL-TV and WILL-AM and -FM radio stations, all affiliated with the Public Broadcasting Service, provide a wide range of cultural programs to a large area of the state.

The Illini Union, the campus social center, contains cafeteria and dining facilities,

guest rooms, art galleries, reading and television rooms, billiards and electronic-game rooms, bowling lanes, a ticket and check-cashing service, alumni offices, and a paperback bookstore. Special events are scheduled throughout the year. The Illini Union Gallery exhibits a broad range of contemporary art and craft objects.

Many concerts are given in the Music Building and Smith Music Hall, and films are shown on campus throughout the year. Students direct, produce, and act in plays presented at the Armory Free Theatre.

RECREATIONAL FACILITIES

The University of Illinois is the home of one of the top collegiate recreational sports programs in the nation, the Division of Campus Recreation (DCR). All sectors of the University can participate in the multifaceted recreation programs sponsored by the division.

Recreational programs and services include excellent multipurpose facilities, special events, outdoor recreation, sports clubs, intramurals, exercise and fitness programs, Ice Arena activities, and student leadership and employment opportunities.

One of the most popular recreational areas on campus is the Intramural-Physical Education (IMPE) Building on Peabody Drive. This facility contains gymnasiums, indoor and outdoor swimming pools, handball/racquetball and squash courts, and outdoor tennis courts. There are also weight-training rooms, exercise rooms, an archery range, a camping equipment and resource room, a games room, combatives rooms, and offices.

The newly renovated and remodeled Ice Arena, 406 East Armory, is open year-round for skating, hockey, broomball, skating lessons, parties, and other activities. A new athletic facility, the Atkins Tennis Center, opened in 1991.

Throughout the year, DCR offers diverse programs to appeal to a wide range of interests. These special events include Quad Day, Sports Trivia Bowl, poolside concerts, and activities for children living in Orchard Downs.

Exercise and fitness programs sponsored by DCR include aerobics classes; water exercise; low-impact aerobics classes; and the Illini Century Club for self-paced wheelchair pushers, joggers, swimmers, and cyclists. Several wellness clinics are also offered throughout the year.

More than forty sports clubs provide a variety of activities for students, ranging from martial arts and scuba to rugby and ice hockey. Team and individual sports competition, practice sessions, and tournaments with other universities are possible.

The outdoor recreation program offers opportunities for students to rent camping and sports equipment such as tents, backpacks, and skis. Several outdoor clinics, weekend workshops, and extended trips to such areas as the Grand Canyon and the Florida Everglades are scheduled during the year.

Approximately forty activities are available to students in the organized intramural sports program. Students can participate in men's, women's, corecreational, and graduate/faculty/staff divisions in sports ranging from flag football, soccer, and basketball to tennis, swimming, and wrestling. Novel sports such as inner-tube water polo, ultimate frisbee, broomball, and wallyball have many enthusiastic participants.

Students may apply for part-time employment and volunteer leadership opportunities at DCR. Each year more than 400 students work as intramural sports officials and supervisors, lifeguards, receptionists, designers, aerobic instructors, first-aid supervisors, building supervisors, and intramural managers.

GRADUATE STUDENT ADVISORY COUNCIL

The Graduate Student Advisory Council (GSAC) communicates the concerns of graduate students to the dean and staff of the Graduate College. Responding to the changing needs of graduate students, GSAC identifies and clarifies the issues and makes recommendations to the Graduate College. GSAC is composed of fifteen appointed graduate students, representing the range of graduate programs at the University of Illinois at Urbana-Champaign. In addition to the council members, each department has a graduate student who serves as a contact person for GSAC. Apart from GSAC, graduate student associations are active in many departments.

THE OFFICE OF INTERNATIONAL STUDENT AFFAIRS

The Office of International Student Affairs at 510 East Daniel Street, Champaign, provides international students with many services, including advice and information on visas and other federal regulations applying to international students, alien income tax returns, insurance and housing problems, payroll clearances, social security numbers, English language problems, and personal problems.

GRADUATE COLLEGE MINORITY STUDENT AFFAIRS OFFICE

The Graduate College Minority Student Affairs Office coordinates minority graduate student recruitment, collects and disseminates information for prospective and current minority students, and counsels minority students who have problems with financial aid, academic matters, race relations, or personal and social concerns. In addition, the office supports the activities of many campus groups involved with minority graduate students, including the Black Graduate Student Association, La Casa Cultural Latina, the Bilingual Multicultural Education Student Association, and the African-American Cultural Program. These groups, in turn, help the office in disseminating information and assisting students.

REHABILITATION EDUCATION SERVICES

Since 1947 the University of Illinois at Urbana-Champaign has pioneered in facilitating the education of students with disabilities. Campus facilities are among the best in the nation, and applications from persons with disabilities are welcomed. The Division of Rehabilitation Education Services in the College of Applied Life Studies is responsible for planning campus facilities to ensure that all are accessible to and usable by the physically disabled. The division also provides a variety of services and opportunities such as early registration privileges, housing arrangements, transportation, prosthetic repair, physical therapy and functional training, medical services, counseling services, recreation and athletics, and services to the visually and hearing impaired. For information about graduate education and degree programs in rehabilitation education, with areas of concentration in counseling and administration, applicants are encouraged to contact the director of the division at the Rehabilitation Education Center, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, IL 61820; (217) 333-4600.

Some graduate programs require specific physical skills. Prospective students with permanent disabilities are therefore strongly encouraged to communicate with the division to ascertain how their particular program can be implemented. The

division works closely with academic units to establish the manner in which degree requirements can be met.

FINANCIAL AID

Financial aid is available in the form of fellowships, teaching and research assistantships, tuition and service fee waivers, college work-study programs, and loans.

Application Procedures

All students who apply for admission to graduate study receive consideration for fellowships (except those awarded in national competitions), teaching and research assistantships, and tuition and service fee waivers; there are no separate financial aid applications for applicants. Currently enrolled students seeking consideration for these awards should submit the Application for Graduate Appointment, available from departments or the Graduate College, to their major departments. Financial need is not a factor in awarding fellowships, waivers, or assistantships administered by the University.

Continuing or new students should file applications with their major department no later than February 1, and preferably earlier. (Some departments in high demand have deadlines earlier than February 1; prospective students are advised to make sure of the departmental deadline before applying.) While departments may, at their discretion, accept applications after the February 1 deadline, most departments attempt to make their financial aid decisions in February and March; thus, applications arriving later may not receive financial aid consideration. Departmental committees recommend students for fellowships or waivers to the Graduate College, which makes the final selections. Each department appoints its own teaching or research assistants with the approval of the Office of the Vice-Chancellor for Academic Affairs. Fellowships can be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates. The first list of fellowship awards is usually announced in mid-March.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible to compete for University fellowships, which are awarded on the basis of academic and scholarly achievement. A student need not be a U.S. citizen to apply. Departments (with Graduate College approval) may combine University Fellowship stipends with teaching or research assistantship appointments. Students should consult their departments about available support.

Graduate College Fellowships. These fellowships are part of the Graduate College's effort to increase the enrollment of students from certain underrepresented and disadvantaged groups. Graduate College fellowships are generally awarded to students who are beginning graduate work so that they can devote their first year entirely to study.

Most Graduate College fellows are given support in the form of other fellowships and assistantships to continue their studies in subsequent years, provided their progress is satisfactory; however, continued support cannot be guaranteed in advance. Graduate College permission is required for concurrent employment of any type.

Industrial, Endowed, and Special Fellowships and Traineeships. A number of firms, foundations, and individuals support fellowship awards for graduate students. The stipends and supplemental allowances for these fellowships vary, and most of them are restricted to students in particular areas of study. In almost all cases, these awards provide tuition and most fees. Students should consult their departments about the availability of these fellowships.

Federal Fellowships. These fellowships, such as the U.S. Public Health Service traineeships in the biomedical sciences and the Patricia Roberts Harris fellowships in fields where minorities are underrepresented, are awarded as grants to institutions, which then select the recipients. Students should consult their departments as to the availability of these awards. Applicants for most federal fellowships must be U.S. citizens or permanent resident aliens; some programs are restricted to U.S. citizens.

Fellowships Awarded in National Competition. The National Science Foundation awards approximately 750 fellowships nationwide each year to exceptional students in science and engineering, the social sciences, and the history and philosophy of science. They are restricted to students who have completed not more than one semester of graduate study and will be continued for up to three years if progress is satisfactory. Applications are available in October from the Graduate College Fellowship Office, University of Illinois at Urbana-Champaign.

The Howard Hughes Medical Institute Doctoral Fellowships in the Biological Sciences provide three years of support at $14,000 annually, plus tuition. Applications are available in September in the Graduate College Fellowship Office, University of Illinois at Urbana-Champaign.

The Department of Defense awards three-year fellowships to outstanding students in certain fields in the sciences and engineering. U.S. citizens studying at PhD-granting institutions are eligible. Applications are available in October in the Graduate College Fellowship Office, University of Illinois at Urbana-Champaign.

The Jacob Javits Fellowship Program, administered by the U.S. Department of Education, awards about 130 fellowships each year in a nationwide competition. The fellowships provide all tuition and fees, as well as a stipend calculated on the student's financial need. U.S. citizens and permanent residents are eligible to apply. Applications are available in the late fall.

A few other foundations and agencies also hold fellowship competitions but on a smaller scale and usually restricted to specific groups, such as the Committee on Institutional Cooperation fellowships for minority students or the American Association of University Women fellowships. Information on these and other fellowships is available early each fall in the Graduate College Fellowship Office.

Assistantships

General Information. The various departments of the University appoint graduate students as teaching or research assistants. Application should be made directly to the appropriate department by using the Application for Graduate Appointment. Students holding assistantships must be registered during the semesters of employment and, in the case of assistantships requiring the performance of classroom teaching, must be proficient in oral English as determined by current University verification standards. Assistantship appointments ranging from 25 through 67 percent time for three-quarters of the semester provide waivers of tuition and part

of the fees. Students who held such waivers during the spring semester, and who have no appointments the following summer, are also entitled to a waiver of tuition and part of the fees for that summer session. As an additional benefit, spouses and dependent children of staff members who have appointments of at least 25 percent time are treated as residents for purposes of tuition assessment. Students may also apply for assistantships in nonteaching units of the University, such as the Computing and Communications Services Office.

Part-time appointments as student residence hall advisers are also available. These jobs provide room and board only. The student affairs coordinator for staff development in the Housing Division has applications for residence hall adviser appointments.

A student who resigns an appointment before working for at least three-fourths of the term (ninety-one days during the regular semester, forty-one days during the summer session) will be assessed tuition and fees unless the student either withdraws from the University at the same time or before the appointment becomes void or files a clearance form for graduation within one week after the resignation date. A term is defined as running from the first day of registration through the last day of final examinations.

College Work-Study Assistantships

The Graduate College operates a small program of research and administrative assistantships funded by the College Work Study program. Prospective applicants must have obtained the promise of assistantship employment for the next academic year at the time of application, which should take place before January 31 of each year. To apply, the applicant should fill out a screening questionnaire in the Fellowship Office, 209 Coble Hall. If eligible, he or she must use the need-based financial aid procedure described on page 28.

Tuition and Service Fee Waivers

In addition to the tuition and service fee waivers that accompany fellowships and assistantships, the Graduate College awards a number of waivers each year. These waivers provide exemption from tuition and some fees for the academic year and the summer session immediately preceding or following that year. To hold one of these waivers, a student must register for at least 3 units each semester during the academic year and $1^1/_2$ units in the summer session. While holding such a waiver, a student may accept part-time or incidental employment not to exceed twenty hours per week either with the University or with an outside employer.

Research Grants

Graduate College Dissertation Research Grants. The Graduate College offers grants for dissertation research to students with superior academic records and dissertation proposals. Competitions are held each fall and spring semester. For further information, inquire in the Graduate College Fellowship Office.

Other Research Grants. A great number of organizations and foundations offer grants to support research in specialized fields. Information on these grants can be obtained from the Graduate College Fellowship Office, the Research Services Office, and departmental offices. Some schools and colleges publish additional materials concerning research grants and contracts.

Need-Based Financial Aid

The Office of Student Financial Aid awards limited scholarships, college work-study, and loans to graduate and professional students. Application for this need-based assistance is made separately from an application for fellowships, assistantships, and tuition and service fee waivers. A need analysis document, either the Family Financial Statement (FFS) or the Financial Aid Form (FAF), must be completed. To ensure priority consideration, the document should be filed between January 1 and March 15 of each year.

A student wishing to obtain a Guaranteed Student Loan must file the FFS or FAF in addition to the loan application. Students are advised to delay processing the guaranteed student loan application until they have received responses to applications for other need-based assistance and fellowships, assistantships, and tuition and service fee waivers.

Additional information about need-based assistance and application packets containing the Family Financial Statement are available from the Office of Student Financial Aid.

If certification for full-time status is required (for example, for loans, immigration, or fellowships), a student must register for at least 3 units or the equivalent.

Veterans' Assistance

Veterans who believe they may be eligible for educational benefits should contact the veterans' counselor in the Office of Student Financial Aid. Application for benefits should be made annually.

Employment

Part-time job opportunities, both on and off campus, are posted in the Office of Student Financial Aid. Students are not required to apply for need-based assistance to use employment staff services.

Emergency Loans

In addition to major educational loans, the University makes special funds available. Graduate students with financial problems should go to the Office of the Dean of Students. Staff members in that office can determine the eligibility of these students for emergency loans.

Students may also apply for guaranteed loans through lenders in their hometowns who participate in one of the various guaranteed loan programs.

HOUSING

The University of Illinois maintains housing for single graduate students in two residence halls within walking distance of the campus. Each study room is furnished and connects with a complete bath shared with the residents of one or two other rooms. Single and double rooms are available. Cooking is not allowed in student rooms, but a contract for food service in nearby dining rooms can be arranged. Residence halls have lounge facilities, laundry rooms, and vending machines.

Students must be admitted before they can sign a housing contract. Priority in assignment is determined by the date that the completed contract is received. Students should make housing arrangements well before the term begins. For information, write to the Residence Hall Contracts Office, 200 Clark Hall, 1203 South Fourth Street, Champaign, IL 61820.

Married students and students with families can choose from one-bedroom (furnished) or two-bedroom (furnished or unfurnished) apartments. All units include a stove and a refrigerator. Convenient laundry facilities are available. For information, write to the Family Housing Office, 1841 Orchard Place, Urbana, IL 61801.

The Housing Information Office also maintains a current listing of privately owned apartments and rooms available in the community. Students seeking private housing are urged to visit the campus as early as possible, because all arrangements for this type of accommodation should be made in person. Anyone unfamiliar with standard leasing practices should ask a housing consultant for assistance. The Housing Information Office is located at 2 Turner Student Services Building, 610 East John Street, Champaign, IL 61820; (217) 333-1420.

The University of Illinois at Urbana-Champaign and the University residence halls are committed to a policy of nondiscrimination with respect to race, color, national origin, ancestry, religion, sex, marital status, sexual orientation, age, handicap, unfavorable discharge from the military, or status as a disabled veteran or veteran of the Vietnam era.

HEALTH SERVICE AND INSURANCE

Students enrolled in credit courses and in attendance on the Urbana-Champaign campus are assessed separate fees that cover health service at the McKinley Health Center and group health insurance.

Health Service

The health service fee supports the medical services available on campus at the McKinley Health Center. These services include (1) the diagnosis, treatment, and follow-up of acute and chronic illnesses; (2) a twenty-four-hour "dial-a-nurse" to advise on appropriate treatment and referral to local hospitals; (3) gynecology services; (4) preventive medicine; (5) mental health care; and (6) health education. In addition, many diagnostic tests are available, including laboratory procedures and radiologic examinations. A pharmacy provides most medications free of charge when they are prescribed by a McKinley Health Center physician.

All of these services are available at no additional cost to students who have paid the health service fee. Dependents are not eligible for care at the health center unless they are also enrolled students at the Urbana-Champaign campus. McKinley Health Center is fully accredited as an ambulatory health-care facility by the Joint Commission on Accreditation of Healthcare Organizations.

Counseling Service

The Counseling Center is staffed by clinical and counseling psychologists, a health educator, a reading and study method specialist, predoctoral interns, graduate assistants, and paraprofessionals who provide a variety of services to help students

with academic, personal, relationship, and vocational problems. Among the services offered are workshops on specific topics such as completing the dissertation, teaching college students, identifying and referring troubled students (the latter two for teaching assistants), test anxiety, time management, adult children of alcoholics, survivors of child sexual abuse and acquaintance rape, long distance relationships, and dual-career issues. Also offered are reading and study classes; individual, couple, and group counseling (short- and intermediate-term), and referral services for long-term counseling; and consultative services to University departments and staff members.

The Counseling Center has a Self-Management Laboratory located in the Undergraduate Library. The center aims to be aware of and sensitive to both the regular and special needs of minority students, international students, and gay and lesbian students. Fees for the services of the Counseling Center have been prepaid through the student health fee. All counseling is completely confidential.

Group Health Insurance

The University insurance plan provides worldwide hospital, medical, and surgical coverage for the insured student and the choice of any legally qualified hospital or licensed physician. It also includes an accidental death and dismemberment benefit. The coverage is provided on a term basis and includes all holidays in the term, as well as the period between terms. Brochures that describe the University insurance plan in detail are available at registration and at the Student Insurance Office.

Insured students who wish to purchase health insurance coverage for their dependents may do so. Students enrolled for the spring semester who do not plan to attend the summer session may elect to extend their insurance for the entire summer vacation period by applying and paying the insurance premium to the Student Insurance Office.

Insured students may extend coverage for themselves and their dependents for a limited period following graduation or withdrawal from school. This must be done before they leave campus; it cannot be done by mail. The Student Insurance Office will provide information on procedures and deadlines.

Students who present evidence of continuing equivalent medical insurance coverage may be exempted from paying the fee for the University insurance if they submit a petition to the Student Insurance Office during the period provided for the exemption of fees and if it is approved. Once the student is declared exempt, the exemption is continuous.

Students may request that they be reinstated at any time during a term; however, reentry into the insurance program is subject to approval of a medical history. If approved, coverage is effective on the date of the application. There is no prorated premium.

Requirements and Procedures

ADMISSION AND REGISTRATION

General Requirements

Applicants who have graduated from an accredited college or university, or who hold or will be granted by the end of the current academic year a baccalaureate degree (or its equivalent) comparable in content and in number of credit hours to that granted by the University of Illinois at Urbana-Champaign, may apply for admission to the Graduate College of UIUC. Applicants must have an admission average of at least 4.0 (A = 5.0) computed from the last 60 hours of undergraduate work and any graduate work completed. Meeting these minimum admission requirements of the Graduate College, however, does not guarantee admission; individual departments may set a minimum grade-point average higher than that of the Graduate College and may impose other special admission requirements and conditions. Because applicants to most departments compete for a limited number of positions, many who exceed minimum requirements may be denied admission.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses that have a bearing on the student's field of specialization should submit a written evaluation or a letter grade by the instructor in each such course, along with scores on the Graduate Record Examination. Because some departments have special examination requirements, applicants should check with their prospective departments; for example, accountancy and business administration use the Graduate Management Admission Test instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in November or December for the summer session and fall semester, and September or October for the spring semester. Applications will not be accepted during the three weeks preceding the beginning of a term.

Application forms may be obtained from the major department or the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820. A nonrefundable application fee must accompany the application.

International applicants must submit official records of all higher education, including certificates of degrees with the dates the degrees were conferred. If only one original is available and would be difficult to replace, an attested or certified copy should be submitted. All records not in English must be accompanied by a translated record. Records should show the individual subjects studied and the grades received in each subject.

International applicants are required to submit proof of adequate finances for the entire period of planned study. Applicants unable to provide satisfactory evidence of adequate finances will not be granted admission.

Eligible applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL), given several times a year throughout the world. Applicants should make arrangements directly with the Educational Testing Service, Box 899, Princeton, NJ 08541, U.S.A. Graduate applicants are exempt from this testing if, within five years of the proposed date of enrollment at UIUC, they have completed at least two academic years of full-time study in a country where

English is the primary language and in a school where English is the primary language of instruction.

The University requires a score of at least 520 on the TOEFL examination, and some departments require higher scores. All non-native, English-speaking applicants to the Graduate College who are admitted on the basis of their academic credentials but score below 590 on the TOEFL or fail to submit a required TOEFL score will be admitted on limited status and will be required to take the English Placement Test (EPT) upon their arrival.

The Notice of Admission

The Notice of Admission is issued by the Office of Admissions and Records to applicants when their admission to the University is complete, i.e., when they have been recommended for admission by the department and have been determined to be eligible by the Office of Admissions and Records. The Notice of Admission is official verification that admission has been approved; it is issued for a specific term and should be brought to the initial registration.

A department may request, on an applicant's behalf, that an applicant admitted for a particular term be allowed to enter in a different term without having to repeat the application process. These requests for change of term of entry are granted only if the new term of entry is within one year of the term originally set. Applicants should note that a Notice of Admission for the fall term is also valid for the preceding summer session, and that one issued for the summer session, if not marked "summers only," is also valid for the following fall semester.

The Notice of Admission will specify the admission status of the student: whether the admission is as a degree candidate or as a nondegree student, whether full graduate standing or limited status has been approved, and whether additional credentials are still needed. Each admitted student must submit complete academic credentials to the Office of Admissions and Records before the registration period for the student's second term of attendance. Registration for the second term will be encumbered if the required official transcripts have not been received.

The Notice of Admission may state specific conditions for admission. Admitted students should have a clear understanding of the conditions or should seek clarification from their major departments. A student may be admitted on limited status if his or her preadmission grade-point average (GPA), which is based on the last 60 semester hours of undergraduate work, is below the Graduate College minimum of 4.0 (A = 5.0), or if the academic record shows other deficiencies or nontraditional academic qualifications. After the student has satisfied the conditions imposed, his or her major department should request that the Graduate College change the student from limited status to full graduate standing. No advanced degree will be awarded to a student who has not qualified for, and been granted, full graduate standing.

Enrollment Patterns

Each student admitted can choose one of two enrollment patterns: *continuous*, in which the student must enroll each fall and spring semester, with summer sessions optional; or *consecutive summers only*, in which the student enrolls only for summer sessions. Once an option has been chosen and is established by enrollment, the pattern may not be broken, i.e., the student may not fail to register for a term, unless the Graduate College approves a leave of absence or the Office of Admissions and

Records gives permission to change the enrollment pattern. Graduate students who break their patterns of enrollment without prior approval must apply for readmission in order to resume their studies. However, a student applying for readmission to a graduate degree program in which he or she was enrolled within the previous five years is not required to pay the application fee.

Nondegree Status

Students with nondegree status are admitted to courses on a part-time basis if there is enough space. Once accepted for admission by a department and the Graduate College, a nondegree student has the same enrollment pattern options as a degree candidate. Either the major department or the Graduate College, however, may discontinue the nondegree status at the end of any term. A nondegree student need not apply for admission as long as he or she maintains one of the established patterns of enrollment.

Several restrictions and conditions apply to nondegree status. Nondegree students:

a. Are not eligible to advance enroll.
b. Cannot register until after the third day of classes in the fall or spring semester. The late registration fee will be waived if the student completes his or her registration on or before the tenth day of instruction in a semester.
c. Are required to have approval each term from both their home department and the department offering the course in which they wish to enroll. Admission does not guarantee, therefore, that the student will be able to enroll in all courses desired.
d. Are limited to taking fewer than 3 units per semester. A nondegree student will not be granted full-time status unless he or she is participating in a special program for which full-time approval has been obtained from the Graduate College prior to admission.
e. Are not eligible for financial aid administered by the Graduate College.
f. Must apply for readmission if they wish to become candidates for a degree. If the student is later approved for degree status, a maximum of 3 units of nondegree credit may be applied to a degree.

A nondegree student who wishes to enroll only during the summer sessions need not be admitted by a specific department but may carry an unassigned student status with the Graduate College. Certification of an earned degree is all that is required for admission. Such a student is allowed to register continuously from summer to summer until his or her pattern of enrollment is broken.

Registration

Currently enrolled degree students should advance enroll for the following semester and complete their registration by mail. New and other students who have not advance enrolled should meet with their advisers and complete their schedules before going through on-campus registration. Students who advance enroll are more likely to gain entry into the classes they desire.

Because course descriptions found in the *Courses* catalog are sometimes incomplete or outdated, students should check with their department's graduate studies office or talk with instructors involved to find out about reading lists, papers, projects, and examinations for particular classes.

On-campus registration occurs during the week preceding the start of instruction in a semester. At this time, students who are not advance enrolled or encumbered and students who are advance enrolled but who need to make class schedule changes complete their registration. Students who have not enrolled in advance or who need to make class schedule changes must meet with their advisers and make up their schedules before going through registration. Instructions on how to get through the registration process are printed each semester and are available in all departmental offices and in the Graduate Records Office.

There is a fee for late registration. If, however, failure to complete registration during the regular period is in some way the fault of the University or if there are extenuating circumstances such as severe illness or hospitalization, a student may petition for a waiver of the fee through the Records Office of the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, IL 61801.

IMMUNIZATION POLICY

The University, in accordance with Illinois state law, requires that all new or reentering students who have been absent one or more semesters must show proof of immunity to measles, mumps, rubella, diphtheria, and tetanus. The University requires proof that entering students are immune to poliomyelitis as well. Students who are not properly immunized, in accord with Illinois public health law, must be immunized within the semester they arrive on campus or must present medical or religious reasons for noncompliance. Until they satisfy the immunization requirements, these students will not be allowed to register for subsequent semesters.

TUBERCULOSIS CONTROL

All new, transfer, and readmitted students are encouraged to present evidence of freedom from tuberculosis at the University's McKinley Health Center. Proof of freedom from tuberculosis is necessary for some students, such as new teaching assistants and those who have jobs handling food. All new international students are required to complete tuberculosis screening at McKinley Health Center before finishing registration. Final evidence of freedom from tuberculosis is established by presenting a University of Illinois or public health agency certificate dated within the previous twelve months or by undergoing a tuberculin skin test at the McKinley Health Center that is read negatively at the Health Center within forty-eight to seventy-two hours later.

TUITION AND FEES

Tuition and fees are subject to change; it is therefore difficult to provide exact information. Tuition and fees are assessed on the basis of a student's status (resident or nonresident of Illinois), college of enrollment, and the number of credit hours taken each term. In computing fees, 1 unit is equivalent to 4 semester hours. A complete schedule of fees and an explanation of the eligibility requirements for full or partial exemption are available from the Tuition and Fee Assessment Section, University of Illinois at Urbana-Champaign, 100 Administration Building, 506 South Wright Street, Urbana, IL 61801.

Residence for Tuition Assessment

Tuition is assessed on the basis of whether a student is a resident or nonresident of the state of Illinois in accordance with the *University of Illinois Regulations Governing the Determination of Residence for Admissions and Assessment of Student Tuition.* These regulations are published in the *Code on Campus Affairs and Handbook of Policies and Regulations Applying to All Students.* The *Code* is offered to all students during on-campus registration and is available at the Post-Registration Service Center in the Illini Union; in 177 Henry Administration Building; and at the Student Assistance Center, 107 Turner Student Services Building. The residence regulations and petitions for changing a student's status are available on request from the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 178 Henry Administration Building, 506 South Wright Street, Urbana, IL 61801.

Generally, in order to be considered a resident for the assessment of tuition, a person must have been a bona fide resident of the state of Illinois for at least six consecutive months immediately preceding the beginning of any term for which he or she registers and must continue to maintain a bona fide residence in Illinois. If an adult student has at least one parent who is a bona fide resident of Illinois, this six-month, continuous-residence rule is waived as long as the student resides in Illinois during the period of registration at the University.

Staff members of the University and allied agencies, including teaching and research assistants on appointment for at least 25 percent of full-time services for not less than three-fourths of the term as well as their spouses and dependent children, are treated as residents for tuition assessment purposes as long as they hold their appointments. Professional staff members and teachers in private or public elementary and secondary schools in Illinois are also eligible for in-state tuition charges. Persons who are serving on active duty in one of the armed forces of the United States and who are stationed and present in the state of Illinois, their spouses, and their dependent children may qualify upon petition for the in-state tuition rate. A student who is a U.S. citizen may also qualify upon petition for resident status if he or she is married to a resident of Illinois who meets all the requirements of the residence regulations. A non-U.S. citizen who meets and complies with all other applicable requirements may establish residence status (by petition) unless he or she holds a visa that on its face precludes an intent to reside in the United States.

Installment Plan for Payment of Charges

Students enrolled on campus may elect to pay tuition and all fees, flight instruction costs, and University residence hall charges (single-student housing only) in three approximately equal installments. The first installment is payable by the due date shown on the Post-Registration Statement (within the first ten days of classes), the second is payable in October (March for spring semester), and the third in November (April for spring semester).

Students electing the installment plan are assessed a finance charge. Deferred installments and other charges billed through the student accounts-receivable system are subject to a delinquent service charge on any amounts not paid when due.

Refunds

A student who has not attended any classes or received any student services may cancel his or her registration, and thus all tuition and fees charges, by 5 p.m. on the first day of class in a term. The request for cancellation of registration must be

accompanied by letters from each of the student's instructors confirming that the student did not attend a single class session.

If a student withdraws from the University during the first ten days of instruction in a semester (or during the first seven days in the eight-week summer session), the University will refund all tuition and one half of the service and general fees. The McKinley Health Service fee and the health insurance fee, however, are nonrefundable, because health services and insurance coverage for students continue until the end of the term. The last day for the tuition refund and partial service-fee and general-fee refund is noted in the *Graduate College Calendar* and in the calendar printed in each semester's *Timetable.* In cases of serious illness or injury, exceptions to these refund periods may be made by the director of admissions and records. Special refunds are provided for students who withdraw for military service after the ten- or seven-day period. If it is necessary to withdraw from the University and there is a question concerning a refund, a student should first inquire in the Graduate College Student Records Office, University of Illinois at Urbana-Champaign, B-3 North Coble Hall, 801 South Wright Street, Champaign, IL 61820.

FINANCIAL AID

See page 25.

GRADUATE COLLEGE REQUIREMENTS

The following are the general requirements of the Graduate College. *A Handbook for Graduate Students,* which is distributed to all graduate students enrolled at the University of Illinois at Urbana-Champaign, gives the requirements in more detail. Graduate students should use the *Handbook* as the official statement of Graduate College regulations during their graduate study on the Urbana-Champaign campus. Departments may have requirements that apply in addition to those of the Graduate College. A departmental standard higher than that of the Graduate College (e.g., the minimum grade-point average for degree eligibility) replaces the Graduate College standard.

Departmental and Graduate College policies and requirements change from time to time and may not be immediately reflected in handbooks and other publications. New degree requirements, however, cannot be imposed retroactively on continuing graduate students. If degree requirements are changed, continuing students may complete their degree programs under the requirements in effect at the time of their initial enrollment in the Graduate College. They have the option, however, of electing to be governed by the new requirements if they so desire.

The Graduate College will generally grant no more than two advanced degrees to one individual, nor will it permit a student to earn a graduate degree similar to one obtained elsewhere. Admission to a second nonprofessional (e.g., PhD, EdD, DMA) doctoral program will be permitted by special approval of the dean of the Graduate College upon the recommendation of the department or equivalent unit.

Grading System

Final Grades. Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and Ab or E (failure). No credit will be given for a course in which the grade of E or Ab was received. The grade-point average (GPA) is computed on a five-point scale, with A equal to 5.0. Plus and minus signs do not appear on a

graduate student's official transcript and are not used in computing the GPA, but they may be recorded on departmental records.

Other symbols used, but not included in the computation of the GPA, are

W— Officially withdrawn from a course.

Ex— Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next term in which the student is enrolled. Failure to complete the work within this time automatically results in a grade of E by rule. If the student does not enroll the following term, the excused grade becomes an E by rule after one year.

Df— Grade temporarily deferred. Used only in research and other approved courses that extend beyond one term. The time limit for the Df grade to revert to E by rule is the same as that for the Ex grade, except for the thesis research course (499).

S or U— Satisfactory or unsatisfactory. Used as final grades in the thesis research course (499) and in certain other approved courses.

CR or NC— Credit or no credit. Used only if a student has registered for a course under the credit-no credit option with the approval of his or her major department.

Ab— Absent from the final examination without an acceptable excuse. This grade counts as a failure.

Credit-No Credit Option. Subject to the restrictions of the major department and with his or her adviser's approval, a student may register for graduate credit under the credit-no credit option. The student must, however, have at least 2 units of course work in the graduate program with grades of A through C for every unit of credit-no credit work.

GPA Computation. A registered student's GPA is computed at the end of every term and reported in the Semester Grade Report, which is mailed to the student about ten days after the final day of examinations. The GPA includes units of course work with grades of A through E and Ab but not those with grades of CR, NC, Ex, Df, S, and U. The GPA does not include courses taken for semester hour credit (for example, physical education courses), nor does it include course work transferred from other universities or colleges with the exception of the Chicago campus of the University of Illinois. A student who receives a grade below C, should check with his or her adviser or department to see whether the course must be repeated; a student may also choose to repeat a course. In either case, repeated courses are ignored in the computation of the GPA and the accumulated credits toward a degree.

Minimum GPA. A student is required by the Graduate College to maintain a minimum GPA of 3.75 in order to continue in an advanced degree program. Many departments, however, demand a minimum of 4.0 or higher, and their minimums are enforced by the Graduate College.

A student who completes 3 or more units of graded course work with a GPA of less than the minimum will receive a warning letter from the Graduate College. If after the completion of 3 additional units of graded course work a student's GPA has not been raised to or above the required minimum, or if the GPA falls below it at any

time thereafter, the student will be placed on limited status. If the student's average does not meet the minimum requirement at the end of the first term on limited status, further registration will be prohibited.

Advisers and departments take factors other than satisfactory grades into consideration in determining qualifications for advanced degrees. An adequate GPA does not in itself ensure continuance in an advanced degree program. Records maintained by departments often record deferred and plus and minus grades as well as written evaluations by instructors. These factors, along with other skills and aptitudes, are taken into consideration in departmental decisions about permitting students to continue in master's and doctoral programs.

Credit

Graduate Credit. Graduate credit at the University of Illinois at Urbana-Champaign is measured in terms of units, with 1 unit equal to approximately 4 semester hours. Generally, courses in the 300 series carry graduate credit and are open to both graduate and undergraduate students. Courses in the 400 series, with the exception of some courses such as foreign language, carry graduate credit. Enrollment in these courses is restricted to graduate students or seniors who have petitioned and who meet the requirements to take graduate-level courses.

Proficiency Examinations. Credit earned by passing proficiency examinations cannot be applied to the requirements for advanced degrees, but such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in areas considered important to a student's area of study. A proficiency examination will be recorded only if the student is registered at the time of the examination. These examinations are usually given without cost to the student, but a fee may be charged to defray the cost of examinations prepared by agencies outside the University. Students should consult their advisers before applying for proficiency examinations.

Credit for Work Completed Elsewhere. A student who has completed graduate work elsewhere within the last five years, but has not applied the credit toward any advanced degree, may request that the credit earned for that work be applied to a degree at the University of Illinois at Urbana-Champaign. Students may request that such credit be accepted by submitting petition forms accompanied by official transcripts after successfully completing at least 2 units of graduate work on the Urbana-Champaign campus. Credit for a master's degree completed at the University of Illinois or at another institution cannot be used as partial fulfillment of the requirements for a second master's degree. A student who has earned a master's degree at another university and then completed additional course work at an accredited institution before enrolling at the University of Illinois may petition to transfer credit for that additional work. A student having a master's degree is considered to have completed the first stage of a doctoral program unless the department stipulates otherwise. It should be stressed, however, that all doctoral candidates, regardless of transfer credits or master's degrees completed elsewhere, must complete 16 units in residence on the Urbana-Champaign campus or in courses meeting in other locations that have been approved by the Graduate College for graduate credit.

Research Credit and 499. The time devoted to research is recorded by registration in 499 (thesis credit) or in 400-level courses with such titles as "Independent Study" or "Special Topics." Registration in 499 indicates that the student's research is expected to result in a thesis in partial fulfillment of the requirements for a master's or doctoral degree. Therefore, all students registering in 499 should do so only with full departmental approval. Registration in 499 is required if a thesis is being completed as a degree requirement.

Extramural Courses. Graduate courses are offered by members of the University faculty at various centers throughout the state. Pamphlets listing these courses can be obtained from the Office of Continuing Education and Public Service. An extramural course is considered as work in residence if it is approved for graduate credit by the department offering the course and by the Graduate College. Credit earned in extramural courses can be applied toward an advanced degree only if the courses are approved in advance by the adviser and constitute part of a well-integrated program.

The units of credit required for the master's degree must be earned in courses meeting on the Urbana-Champaign campus or in courses approved by the Graduate College for offering at off- campus locations. Credit for extramural courses can be applied to the second stage of a doctoral program only within the limits of campus residence expected by the department offering the degree.

Correspondence Courses. Credit for correspondence courses cannot be applied toward an advanced degree but can be used to fulfill prerequisites or remove deficiencies. A list of correspondence courses is available from the Office of Continuing Education and Public Service.

Requirements for the Master's Degree

The Graduate College requires a minimum of 8 units of credit for the master's degree. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. Credit applied toward the degree must be earned in courses meeting on the Urbana-Champaign campus, on the Chicago campus, or in other locations approved by the Graduate College for graduate credit. Master's degrees are conferred in May, August, October, and January. Master's candidates must complete all degree requirements, under normal circumstances, within five years after their first registration in the Graduate College.

Some departments require a final examination for the master's degree. Individual departments also determine master's degree thesis requirements. Some departments require or recommend a thesis, but others ask for a "substantial research paper" or require only the minimum 8 units of course work. Thesis credit is earned in courses numbered 499 in each department. No more than 3 units, and in some departments only 2 units, of 499 can be applied to the master's degree.

Requirements for the Doctoral Degree

Credit and Residence. Doctoral programs are divided into three stages, as described below, and must include a minimum of 24 units of credit. At least 16 units, including thesis credit, must be earned in courses meeting on the Urbana-Champaign campus, at the Chicago campus, or in other locations approved by the Graduate College for graduate credit. After the residence requirement has been fulfilled, a student who

plans to leave campus may petition the Graduate College for permission to register in absentia for thesis credit.

Stage I— The master's degree or its equivalent (8 units, or 32 semester hours, of acceptable graduate work at this or another accredited university).

Stage II— One or more additional years devoted to course work and research in preparation for the preliminary examination, and fulfillment of the department's special requirements, if these have not been satisfied earlier. Each department has a procedure for evaluating a student's progress toward the doctorate. This evaluation, either by examination or other formal review, results in a decision about whether a student is making satisfactory progress. The decision is communicated in writing to the student and to the Graduate College. Such evaluation takes place no later than the end of the second year after a student enters the Graduate College. In some departments, the evaluation may take the form of a qualifying examination that a student must pass before entering Stage II of a doctoral program. Passing the preliminary examination marks the end of Stage II.

Stage III— Research and other activities culminating in an approved dissertation and final oral examination. Continuous registration, excluding summer sessions, should be maintained until a student has completed the credit requirement for the doctoral degree. At this stage, a student who cannot maintain continuous registration must apply for readmission in order to continue doctoral study. Registration in 499 (thesis credit) is also required for the term in which a student takes the final examination, regardless of when the thesis will be deposited with the Graduate College or when the degree will be conferred.

Time Limit. Doctoral candidates must complete all degree requirements within seven years after their initial registration in the Graduate College. A student entering directly into Stage II, with a master's degree from another university or with a significant lapse of time since earning a master's degree on this campus, has six years in which to complete degree requirements.

Foreign Language Requirement. Each department establishes its own foreign language requirement; some allow for substitution of research skills in computer programming language or statistical analysis.

Preliminary and Final Examinations

Preliminary examinations taken at the end of Stage II of doctoral programs may be oral, written, or both, depending on the department's policy. Final examinations are oral and public.

The dean of the Graduate College appoints doctoral committees, at departmental request, to administer preliminary and final examinations. These committees must be composed of three or more members of the graduate faculty.

Decisions of the committees for both preliminary and final examinations must be unanimous. Each department outlines its policies regarding preliminary and final examinations as part of the description of its advanced degree programs and requirements that is distributed to graduate students in the department.

Theses

All candidates for the PhD degree and candidates for most other doctoral degrees are required to write a thesis. Individual departments may have special requirements in this respect. In addition, all completed theses must be acceptable for deposit in the Graduate College; a thesis that fails to meet Graduate College standards will be rejected. The thesis must be the work of a single author.

Before the degree is conferred, a student may find it desirable or expedient to publish some of the findings that will later be incorporated in the thesis. If this is done, an appropriate acknowledgment of the earlier publication should be included in the thesis. The Graduate College encourages such publication, but the thesis may not be published in its entirety before all degree requirements have been met.

If thesis research involves the use of human subjects, warm-blooded animals, hazardous materials or procedures, or PLATO® services, the student must comply with the University's policies and procedures governing such work.

Because all theses are made available to the public, a thesis containing classified material, i.e., material deemed nonpublishable under Federal Security Regulations, cannot be accepted.

Advanced Certificate

Some departments, such as those in the College of Education, offer advanced certificates for students who are interested in additional professional training beyond the master's degree but who are not planning to obtain the doctorate. These programs usually require the completion of 8 units of course work beyond the master's degree. Information concerning specific advanced certificate programs is available from departmental offices.

Programs of Study

The graduate programs offered by the Graduate College, through the various divisions, schools, institutes, centers, and departments of the University of Illinois at Urbana-Champaign, are described on the following pages; the areas of specialization within these programs are described as well. Included also are the offerings of several interdisciplinary areas of concentration, such as population studies, environmental studies, American civilization, and African, Asian, Russian, and Latin American area studies.

The minimum requirements for admission and other requirements for graduate degrees are given for each program. Prospective students are reminded that they are seeking admission to the Graduate College of the University of Illinois at Urbana-Champaign and cannot be admitted to the college or to a particular academic department offering programs leading to advanced degrees without satisfying the admission requirements of both. Likewise, both departmental and Graduate College requirements must be met before an advanced degree is awarded by the University. If departmental requirements are higher than the minimum Graduate College requirements, the higher standards apply.

The University of Illinois at Urbana-Champaign *Courses* catalog, published biennially, lists all the undergraduate and graduate courses offered at the Urbana-Champaign campus. A listing of courses offered each term is published in the *Timetable,* issued in April for the fall semester, in March for the summer session, and in October for the spring semester. Copies of the *Courses* catalog and *Graduate Programs* catalog are for sale through the Illini Union Bookstore, 715 South Wright Street, Champaign, IL 61820. Copies can also be purchased by mail from the bookstore. The *Timetable* is available free of charge at the information desk of the Illini Union. The graduate application for admission packet is available free of charge from the Graduate College, University of Illinois at Urbana-Champaign, 202 Coble Hall, 801 South Wright Street, Champaign, IL 61820.

ACCOUNTANCY

Head and Director of Graduate Studies: L.A. Tomassini

Correspondence and Information: Head, Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: P.J. Beck, C.E. Brown, J.R. Dietrich, H.P. Holzer, O.E. Johnson, Y. Kwon, F.L. Neumann, H.M. Schoenfeld, I. Solomon, L.A. Tomassini, E. Willis, V.K. Zimmerman

Associate Professors: M.H. Berry, J.S. Chandler, R.W. Jamison, D. Kleinmuntz, K.H. Molloy, P.A. Silhan, D. Ziebart, R.E. Ziegler

Assistant Professors: J. Davis, N. Desmond, W. Dilla, K. Finger, W. Jung, T. Liang, T. O'Leary, T. Omer, G. Rao, S. Reiter, M. Shelley, T. Sougiannis, D. Stone, W. Teets

Graduate Degree Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science (MAS), Master of Arts, and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the MAS degree requirements can be completed in one year. For nonbusiness graduates, the MAS degree can be earned in two years. The PhD degree takes approximately three to four years of full-time study and research.

Admission. All applicants, native or international, are required to take the Graduate Management Admission Test. This test should be taken early enough to ensure that the results will be available to the department before action on admission. The admission requirements of the Graduate College also apply. In addition, all international applicants must take the Test of English as a Foreign Language and the Test of Spoken English.

Master of Accounting Science. The Master of Accounting Science degree offers a two-year program for students with little or no background in accounting or as little as one year's study for students who wish to expand on an undergraduate degree in accountancy or another business field. All candidates are required to complete at least 8 units of course work. At least 5 units must be at the 400 level; 4 units must be in accounting, and of these 4 units, 3 are specified and 1 is elective. The remaining 4 units are general electives available for meeting the individual student's plans. For example, the student may use some or all of them to develop an area of specialization such as auditing, taxation, information systems, financial accounting, managerial accounting, not-for-profit accounting, or international accounting. A student's program is individually developed in consultation with a faculty adviser. No thesis is required, although students may elect to write one.

To be eligible to complete the MAS program in 8 units, students should have completed an equivalent of the undergraduate curriculum in accountancy at the University of Illinois at Urbana-Champaign, including the following: at least 21 hours of undergraduate work in accounting; a course in general economic theory, in intermediate microeconomics, in computer programming and applications, and in each of the functional fields of business; two courses in statistics; and courses including finite mathematics, linear algebra, and calculus.

Students with little or no business and accounting background are required to complete as many as 8 additional units of work. In the first year of this two-year program, students take four specified graduate courses in accountancy. Depending upon their background, students also enroll in courses in statistics, economics, mathematics, computer programming, and the functional areas of business. Students who already meet any of the requirements of the two-year program receive some credit toward the total 16-unit requirement. In the second year, the requirements are those for all MAS students, as described above.

Master of Science in Accountancy with Specialization in Taxation. The department also offers a separate master's degree in taxation. Students who have been admitted into the MAS program may transfer into the MS (Taxation) program. The program combines required courses in taxation with electives, both within and outside the department. The total program consists of 8 units of course work, of which at least 4 units must be in taxation.

Doctor of Philosophy. Applications for admission to the doctoral program, supported by three letters of recommendation, must be approved by the department admissions committee, which may require an oral or a written examination. For students with a bachelor's degree and adequate background in appropriate areas, the requirements for the doctor of philosophy degree include the following: credit in micro- and macroeconomics; two courses in behavioral science or financial economics; two courses in statistics; five minor area and research technique courses (four of which must be nonaccounting courses); four accounting courses; and the thesis. The student's doctoral program is determined in consultation with a faculty advisory committee. The student's tentative plans for the doctoral thesis serve as a guide in planning the program.

In addition, candidates must pass written and oral preliminary examinations and an oral final examination on the doctoral thesis. In the preliminary examinations, candidates must demonstrate a thorough knowledge of research methods and accounting theory in both its external and internal dimensions; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in the required areas of economic theory, quantitative methods, and behavioral science or financial economics. Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the accountancy graduate program.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to help accounting faculty members and students from other countries come to the University of Illinois at Urbana-Champaign for study and research in accountancy.

The Office of Accounting Research (OAR) was established in 1983 as the research arm of the Department of Accountancy. The mission of OAR is divided into three distinct parts: (1) identify seminal programs that would benefit from attention; the ultimate goal is to generate ideas and concepts that impinge on the development of the accounting discipline; (2) support major research by providing guidance and resources; (3) disseminate research findings to both the academic and professional communities (i.e., practitioners, corporate executives, educators, and regulators).

ADVERTISING

Head of the Department: K.B. Rotzoll
Correspondence and Information: Director of Graduate Studies in Advertising, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: K.B. Rotzoll, T.K. Srull
Associate Professors: J.E. Haefner, T.C. O'Guinn
Assistant Professors: J.A. McCarty, S. Narayanan, C. Otnes, S. Shavitt

Graduate Degree Program. The Department of Advertising offers graduate work leading to the master of science degree. For the program leading to the Doctor of Philosophy in Communications, see page 73.

Admission. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an accredited institution of recognized standing. Applicants are required to submit results from either the Graduate Record Examination or the Graduate Management Admission Test and are required to attach to the application a short essay indicating why they want to do graduate work in advertising. The Graduate College admission requirements also apply.

Master of Science. Candidates for the MS degree must complete at least 9 units. Students with an undergraduate major in advertising can usually earn the MS degree in one academic year and one summer session if they take a full course of study. Applicants without an undergraduate major in advertising may be required to take as many as nine background courses in addition to the 9 units.

At the time of admission, students will be advised of the probable number of units required for graduation. At the time of registration advising, students will be informed of the exact number of units needed to fulfill the MS requirements.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Head of the Department: W.C. Solomon

Correspondence and Information: Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.E. Bond, J.D. Buckmaster, J.C. Dutton, C.O. Hopkins, A.I. Ormsbee, J.I. Palmore, J.E. Prussing, L.H. Sentman, W.C. Solomon, A.R. Zak

Associate Professors: R.A. Beddini, L.A. Bergman, M.B. Bragg, R.L. Burton, B.A. Conway, K.D. Lee, N.S. Namachchivaya, K.R. Sivier

Assistant Professors: E. Loth, P.G. Voulgaris, S.R. White

Emeritus Professors: H.O. Barthel, H.H. Hilton, S.M. Yen

Graduate Degree Program. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of master of science and doctor of philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Typical areas of concentration are aerodynamics, computational fluid dynamics, composite materials, structures, structural dynamics, aeroelasticity, stochastic dynamics, combustion and propulsion, chemical lasers, optimal orbit analysis, guidance and control, space mechanics, and solar and wind energy.

Admission. Typically, the prerequisite for graduate study is the equivalent of the undergraduate curriculum required at the University of Illinois at Urbana-Champaign for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Admission requirements of the Graduate College apply.

Master of Science. Candidates for the degree of master of science are required to complete a minimum of 8 units of credit: 7 units of course work and 1 unit of thesis credit. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in aeronautical and astronautical engineering. Only 1 of the 7 units can be a special project class. For students terminating their studies with the MS degree, a nonthesis option is available by departmental petition. Those not writing a thesis are required to complete a minimum of 9 units of credit. At least 4 units must be in 400-level courses, and 3 of those 4 units must be in aeronautical and astronautical engineering.

Doctor of Philosophy. All students desiring to enter the doctoral program are eligible to take the aeronautical and astronautical engineering qualifying examination during the term they earn their seventh unit of graduate credit, excluding Aeronautical and Astronautical Engineering 499 (Thesis Research). An exam is given at least once a year, and successful passage is required. Students who enter with the master's degree typically take the qualifying exam during the first semester following their admission to the program. Admission to the doctoral program is based upon the course work, the qualifying examination, and an assessment of the candidate's ability to do independent research. Although there is no specific GPA requirement to continue from MS to PhD, as a guide, the candidate will be expected to maintain a minimum 4.0 GPA (A = 5.0) in courses taken in the MS program.

Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for the program of study leading to the degree of doctor of philosophy. Each student plans a program in consultation with a departmental adviser. Courses offered by departments other than the Department of Aeronautical and Astronautical Engineering may be included in the area of study when these courses are of particular value to the work that students desire to emphasize. The program of study must meet with the approval of the departmental adviser. Minimum requirements for the degree consist of 8 units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from 8 units of thesis research. Of the total course units, beyond the master of science course requirement, only 2 units maximum can be special project classes. Of the total PhD course work requirements, at least 6 units must be at the 400 level, and 4 of these 6 units must be in aeronautical and astronautical engineering.

Financial Aid. Financial aid for graduate students is available in the form of fellowships, teaching and research assistantships, and tuition waivers. A block grant from the National Aeronautics and Space Administration supports a multidisciplinary research and training program. Qualified candidates are considered for financial support upon application. In addition, graduate students making satisfactory progress toward their degrees may be considered for financial support.

AFRICAN STUDIES

Director of Graduate Studies: D. Crummey
Correspondence and Information: Director of the Center for African Studies, University of Illinois at Urbana-Champaign, 210 International Studies Building, 910 South Fifth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: E. Accad, E. Bokamba, D. Crummey, R. Hay, B. Kachru, C. Kisseberth, Y. Scheven, D. Shimkin, A. Sofranko, C. Stewart, G. Yu
Associate Professors: S. Ambrose, T. Bassett, K. Cloud, A. Deck, A. Glaze, A. Gottlieb, I. Kakoma, W. Martin, D. Prochaska, M. Saul
Assistant Professors: M. Bowen, D. Brewer, F. Cassimjee, K. Cuno, V. Hoffman-Ladd, T. Turino, A. Winter-Nelson

Graduate Degree Programs. The Center for African Studies administers a two-year program of language and area courses leading to an interdisciplinary master of arts degree. The program provides both language and area training for three constituencies of students: those seeking to match area expertise with professional training; those proceeding to disciplinary-based doctoral work; and those for whom the degree would stand on its own. The center also administers graduate minors in African studies with various departments.

Master of Arts. A candidate must complete 8 1/2 units of graduate credit in area studies courses, drawn from at least three different units, and must study or demonstrate proficiency in a language indigenous to Africa to the advanced (third-year) level. One of the area courses must be African Studies 450, the center-originated interdisciplinary seminar.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects African studies as a minor must secure approval from the center and must earn at least 4 units of graduate credit in approved courses in at least two departments. Courses are available in the following fields: agricultural economics, anthropology, art history, comparative literature, economics, education, French, geography, history, linguistics, political science, and sociology.

Financial Aid. Each year the center is generally able to assist a limited number of graduate students in area studies through awards of Foreign Language and Area Studies Fellowships.

AGRICULTURAL ECONOMICS

Head of the Department: David L. Chicoine

Correspondence and Information: Head, Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 305 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.B. Baker, P.J. Barry, C.A. Bock, J.B. Braden, R.J. Burdge, D.L. Chicoine, J.M. Due, D.E. Erickson, L.P. Fettig, T.L. Frey, P. Garcia, D.L. Good, M.R. Grossman, H.D. Guither, T.A. Hieronymus, L.D. Hill, R.A. Hinton, R.M. Leuthold, D.A. Lins, A.G. Mueller, J.W. Robinson, J.R. Roush, S.C. Schmidt, J.T. Scott, W.D. Seitz, A.J. Sofranko, S.T. Sonka, R.G.F. Spitze, E.R. Swanson, J.C. van Es

Associate Professors: J.E. Allen, R.L. Farnsworth, R.J. Hauser, R.H. Hornbaker, C.H. Nelson, S.R. Thompson, L.J. Unnevehr, M.M. Wagner

Assistant Professors: D.S. Bullock, J.B. Crihfield, R.J. Garcia, M.A. Mazzocco, G.C. Nelson, H. Onal, D.R. Purnell, B.J. Sherrick

Graduate Degree Programs. The Department of Agricultural Economics offers courses leading to the master of science and doctor of philosophy degrees. Areas of concentration and specialization are offered in agricultural finance; international and agricultural policy; farm and agribusiness management; marketing and agricultural prices; natural resource, production, and environmental economics; quantitative and research methods; and rural community development. Rural community development has an emphasis on either agricultural economics or rural sociology.

Master of Science. Graduate College admission requirements apply. Applicants are favorably considered for admission if they are adequately prepared for advanced study as demonstrated by their previous program of study and scholastic record. Students having fewer than 12 semester hours of agricultural economics or economics may be required to take additional courses to prepare adequately for graduate studies. Students who desire to specialize in rural community development with the rural sociology emphasis should have had a minimum of 6 semester hours of rural sociology or sociology.

The minimal 8-unit program must include at least 1 unit in economic theory; 4 units of agricultural economics, including 2 units in core courses and 2 units of thesis credit; 1 unit in quantitative methods and research methodology; and 2 units of open electives. No more than 2 units of thesis credit can be included in the 8-unit program. The required thesis may be waived under certain circumstances. Students are examined orally on the thesis and/or a general knowledge of their field to determine qualification for the master's degree. Master's students who take prescribed courses and meet specific grade standards may apply for transfer to the doctoral program without completing MS requirements.

Doctor of Philosophy. Graduate College admission requirements apply. Applicants with a master's degree in agricultural economics or a closely related discipline and with an outstanding scholastic record are favorably considered for admission. Students enrolled in the MS program who achieve outstanding grades in prescribed courses and demonstrate research ability may apply for transfer into the PhD program.

Doctoral candidates must complete at least 8 units of nonthesis courses beyond the master's degree. The total graduate program must include a minimum of 3 units in advanced economic theory; 1 unit each of approved courses in econometrics and in mathematical programming; and 1 additional core course in agricultural economics. Students must achieve at least a B average in the required core courses. In addition, students must pass two written and one oral preliminary examinations, submit an acceptable dissertation, and pass a final oral examination. A minimum of 24 units of graduate credits (16 units beyond the master's degree), including thesis credits, is required.

Financial Aid. University fellowships and tuition and fee waivers are awarded by the Graduate College. Several fellowships are also awarded on the basis of competition among graduate

students studying in departments in the College of Agriculture. In addition, the Department of Agricultural Economics awards several fellowships and maintains a number of part-time positions—most of them in research—for graduate students. These assistantships are offered on a competitive basis. For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Head of the Unit: Edward W. Osborne
Correspondence and Information: Agricultural Education, University of Illinois at Urbana-Champaign, College of Agriculture, 124 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professor: B.E. Swanson
Associate Professors: P. Buriak, E.W. Osborne, E.B. Russell
Assistant Professor: D.A. Law
Emeritus Professors: P.E. Hemp, L.J. Phipps

Graduate Degree Program. The master of science program has been planned as a professional degree for students who have completed the requirements of a four-year curriculum in agricultural education or allied fields of study. Areas of concentration include youth development, adult education, curriculum development, program planning, teaching methodology, and instructional technology.

Admission. The program is open only to students who have received a bachelor's degree. The Graduate College admission requirements apply.

Master of Science. Candidates must earn 8 units: 4 units in agriculture, 2 units in education, and 2 units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields. At least 3 of the 8 units must be in 400-level courses. Agriculture courses and electives must be selected with the approval of the adviser. A master's thesis is optional.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for education. Currently, agricultural education doctoral students are admitted into the Department of Vocational and Technical Education in the College of Education while working under the guidance of agricultural education faculty members in the College of Agriculture.

Major Areas of Faculty Research Interest. Research strengths among faculty members in agricultural education include curriculum reform, program planning, change orientation of educators, problem-solving instruction, psychomotor skill acquisition, extension education, youth development, and international agricultural education and knowledge systems.

Resources. Graduate students in agricultural education have at their disposal the considerable resources of the College of Agriculture and the campus. These include microcomputer and mainframe computer facilities, agricultural education archives for historical research, instructional resources, the Vocational Agriculture Service, agricultural communications, and the Office of International Agriculture.

Financial Aid. Assistantships and waivers of tuition and most fees are given on a competitive basis through funds provided by the College of Agriculture and the Graduate College. Part-time positions on research projects are often available. Further information and a copy of the graduate program brochure may be obtained by writing to the address above.

AGRICULTURAL ENGINEERING

Head of the Department: Roscoe L. Pershing
Correspondence and Information: Head, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 338 Agricultural Engineering Sciences Building, 1304 West Pennsylvania Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L.E. Bode, L.C. Christianson, D.L. Day, C.E. Goering, J.W. Hummel, D.R. Hunt, B.A. Jones, Jr., J.K. Mitchell, M.R. Paulsen, R.L. Pershing, E.D. Rodda, J.C. Siemens
Associate Professors: P. Buriak, R.C. Coddington, S.R. Eckhoff, M.C. Hirschi
Assistant Professors: R.A. Aherin, K.D. Konyha, J.B. Litchfield, J.F. Reid, G.L. Riskowski

Graduate Degree Programs. The Department of Agricultural Engineering offers the master of science and doctor of philosophy degrees.

Master of Science. Admission requirements include completion of an undergraduate program equivalent to the agricultural engineering curriculum at the University of Illinois at Urbana-Champaign with at least a 4.0 grade-point average (A = 5.0) for the last 60 semester hours of course work. Applicants whose native language is not English must present a TOEFL score of 570 or more (also see Graduate College minimum). Students may concentrate study in one of the areas of research specialization listed below. Supporting course work includes mathematics; computer science; statistics; engineering mechanics; civil, electrical, and mechanical engineering; agronomy; food science; and other appropriate fields. The completion of $8^1/_4$ units and the preparation and defense of a thesis involving an analytical or experimental investigation (which satisfies 2 units of credit) are required of MS candidates unless a waiver of thesis is granted. At least 3 of the units for the MS degree must be in 400-level courses, and 2 of these units must be in agricultural engineering. Candidates who are permitted to pursue a nonthesis degree must complete a minimum of 9 units.

Doctor of Philosophy. Admission is limited to individuals who have demonstrated exceptional ability through outstanding performance in obtaining the master of science degree and/or through a high degree of technical and professional accomplishment. Candidates must also satisfy entrance requirements for the MS degree program.

Opportunities for study are found in all of the areas of specialization listed below. Candidates will be required to include course work and staff consultation from the various disciplines within the University to build strong technical programs and to fulfill the standard requirements of the Graduate College. There are no foreign language requirements; however, a high degree of competence may be required in areas associated with thesis research, such as statistics, simulation, and computer programming.

Research Interests. Students may specialize in power and machinery (tillage and soil dynamics, crop production systems, pesticide application technology, finite and boundary element analysis, dynamic system simulation, and engines and alternative fuels); soil and water mechanics (drainage, erosion and sediment control, hydrology, irrigation, mechanics of erosion, and water quality); structures and environment (structural analysis and design; building materials evaluation; bioprocessing of agricultural wastes and byproducts; and environmental control for plant, animal, and human biological systems); food and process engineering (engineering properties of foods, physical properties of biological products, crop conditioning, grain drying, milling, grain quality evaluation, transport phenomenon in biological materials, fermentation, nonfood uses of cereal grains, and alternative energy systems); or electronic and electrical systems (biosensors and controls, nuclear magnetic resonance imaging, machine vision, near-infrared reflectance applications, energy systems, and microprocessor control applications).

Financial Aid. Fellowships, supported both by University and by College of Agriculture funds, are available on a competitive basis. A limited number of assistantships, providing both teaching and research experience, are usually available on a half-time basis.

AGRONOMY

Head of the Department: G.H. Heichel

Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-203 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.L. Banwart, R.L. Bernard, C.W. Boast, S.G. Carmer, J.W. Dudley, D.W. Graffis, J.E. Harper, J.J. Hassett, G.H. Heichel, J.D. Hesketh, T.D. Hinesly, R.G. Hoeft, D.A. Holt, T. Hymowitz, R.L. Jones, E.L. Knake, R.J. Lambert, J.R. Laughnan, M.D. McGlamery, D.A. Miller, J.J. Nicholaides III, C.D. Nickell, W.L. Ogren, T.R. Peck, D.B. Peters, M.J. Plewa, A.R. Portis, R.W. Rinne, R.D. Seif, D.M. Steffensen, E.W. Stoller, L.M. Wax, J.M. Widholm

Associate Professors: D.P. Briskin, M.A. Cole, R.G. Darmody, M.G. Huck, R.L. Mulvaney, E.D. Nafziger, R.L. Nelson, K.R. Olson, E.B. Patterson, G.E. Pepper, J.W. Stucki, L.O. Vodkin

Assistant Professors: F.E. Below, T.J. Bicki, T.R. Ellsworth, S.E. Hollinger, F.L. Kolb, A.L. Kriz, R.A. Liebl, A.L. Rayburn, T.R. Rocheford, W.R. Roy, F.W. Simmons, R.H. Teyker, R.M. Vanden Heuvel

Graduate Degree Programs. The Department of Agronomy offers course work leading to the master of science and doctor of philosophy degrees. Great flexibility exists for planning programs in various areas, and no rigid curricula are prescribed. The following areas of specialization indicate the breadth of opportunities, although they are not mutually exclusive: plant breeding, genetics, cytogenetics; molecular genetics and genetic engineering; crop physiology and biochemistry; weed science; soil fertility; soil management and conservation; crop production and management; crop ecology; soil chemistry; soil genesis, classification, and pedology; soil microbiology and biochemistry; soil physical chemistry and mineralogy; soil physics and management; biometry; environmental agronomy; international agronomy.

Admission. Applicants whose highest degree is the bachelor's degree will be considered for admission to the MS program. Admission to the PhD program will be considered for applicants with the MS, those nearing completion of the MS, and in rare cases, those with the BS. Because of the diversity of programs in the Department of Agronomy, the preparation that is needed varies considerably. Undergraduate training equivalent to that required at the University of Illinois at Urbana-Champaign for majors in agricultural science (plant or soil science), agronomy, crops, or soils is appropriate. For some programs, greater emphasis is given to previous training in plant sciences, chemistry, geology, or mathematics. In all cases, previous experience or other significant evidence of serious interest in crops and/or soils is expected. A grade-point average of at least 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. Candidates must complete 8 units of graduate study as approved by their graduate advisory committee with a grade-point average of at least 4.0, present an acceptable thesis, and pass an oral examination. At least 3 units must be at the 400 level, including at least 2 units in agronomy and at least 1 unit of course work other than Agronomy 499. An acceptable thesis is required, although the thesis may be waived and additional course work substituted. The master's examination is oral, although written examinations may be required at the option of the examining committee.

Doctor of Philosophy. Candidates must complete a minimum of 24 units of graduate study (16 units of in-residence credit beyond the MS, 8 units of which must be course work approved by the advisory committee and with a grade-point average of at least 4.0). For students admitted without an MS, an oral examination must be passed after completion of 5 (or more) units of graded course work. Students are required to pass an oral preliminary examination, usually after completion of the PhD course work requirements. An acceptable thesis is required. An oral final examination, consisting of a defense of the thesis and examination on such other matters as members of the examining committee may select, is required. The qualifying, preliminary, and final examinations may include written sections at the option of members of

the examining committee. At least 4 units of 300- or 400-level courses outside the Department of Agronomy are required. Residence requirements are the same as those of the Graduate College.

If the graduate advisory committee requires a student to demonstrate reading competence in French, German, or other approved foreign languages, the course work requirement may be reduced by 1 1/2 units for each foreign language (maximum of 3 units substituted). Students whose native language is not English may fulfill the requirement for one language with their native tongue, if approved by the advisory committee.

Research Interests. Excellent laboratory, greenhouse, and field research facilities are available. A network of experimental locations throughout the state and cooperative arrangements with other states make studies possible under a wide range of environmental and climatic conditions. The department's involvement in international programs may provide opportunities to conduct thesis research abroad. Brochures that provide more details about the graduate program and faculty research interests are available upon request.

Specialization in Genetics.* The Department of Agronomy offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Fellowships and assistantships are available to outstanding students on a competitive basis.

**A proposal to establish a specialization in genetics is pending campus approval.*

AMERICAN CIVILIZATION

Graduate Degree Program. An interdisciplinary concentration in American civilization is available, leading to the master of arts or doctor of philosophy degree. Students interested in this program enroll in the Department of History. Information may be obtained from the Department of History.

ANIMAL SCIENCES

Head of the Department: Dennis R. Campion
Correspondence and Information: Department of Animal Sciences, University of Illinois at Urbana-Champaign, 327 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.M. Bahr, D.H. Baker, M.P. Bryant, T.R. Carr, J.H. Clark, R.A. Easter, G.C. Fahey, Jr., W.R. Gomes, R.W. Gorden, M. Grossman, P.C. Harrison, K.W. Kelley, B.L. Larson, J.R. Lodge, R.I. Mackie, J.L. Robinson, L.B. Schook, S.L. Spahr
Associate Professors: D.B. Faulkner, R.L. Fernando, H.W. Gonyou, C.N. Graves, W.L. Hurley, D.J. Kesler, L.M. Lawrence, H.A. Lewin, F.K. McKeith, N.R. Merchen, M.R. Murphy, J.E. Novakofski, D.F. Parrett, C.M. Parsons, R.D. Shanks, L.H. Thompson, B.A. White
Assistant Professors: J.K. Drackley, H.R. Gaskins, K.H. Kline, J. Odle, D.P. Philipp, M.B. Wheeler

Graduate Degree Programs. The Department of Animal Sciences offers graduate work leading to the master of science and doctor of philosophy degrees. Fields of specialization include animal breeding and genetics, animal behavior, biochemistry, environmental physiology, immunobiology, meat science and muscle biology, microbiology, nutrition, systems of animal management and production, physiology of lactation, and physiology of reproduction. Beef and dairy cattle, horses, poultry, sheep, swine, and a variety of companion and laboratory animals are available for study.

Admission. Candidates for admission to the MS and PhD programs must have a bachelor's degree from accredited institutions equivalent to those from the University of Illinois at Urbana-Champaign. A grade-point average of 4.0 or higher (A = 5.0) for the last 60 hours of undergraduate work and for any graduate study is required for admission. It is strongly recommended that students take the Graduate Record Examination, both the aptitude test and the advanced test in chemistry or biology. Emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. Students must complete a minimum of 8 units of graduate credit, including 5 1/2 units of lecture and laboratory classes, 1/2 unit of seminar, and 2 units of thesis research. At least 3 units of credit must be in 400-level courses, including at least 2 units in animal sciences and at least 1/2 unit of lecture and laboratory classes. Students will be expected to register for graduate seminar (0 to 1/2 unit of credit) during each semester of study. A comprehensive oral examination concerning the thesis and other areas of animal agriculture will be required.

Doctor of Philosophy. Doctoral candidates must complete a minimum of 16 units of credit beyond the requirements for the MS degree, including 7 units of advanced lecture and laboratory courses, 1 unit of seminar, and 8 units of thesis research. Students must pass preliminary and final examinations administered by committees appointed by the dean of the Graduate College. The final examination is limited to a presentation and defense of the thesis research.

Specialization in Genetics.* The Department of Animal Sciences offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Financial aid for graduate students in animal sciences is available in the form of fellowships, teaching and research assistantships, tuition and partial fee waivers, and traineeships. Qualified candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally receive a full tuition waiver and a partial fee waiver, as well as a stipend.

**A proposal to establish a specialization in genetics is pending campus approval.*

ANTHROPOLOGY

Head of the Department: Thomas J. Riley
Associate Head: Paul A. Garber
Director of Graduate Studies: F.K. Lehman
Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.J. Bareis, E.M. Bruner, C.E. Cunningham, J.W.D. Dougherty, E. Giles, D.C. Grove, F.K. Lehman, E. Mayer, B. Nettl, D.W. Plath, N.E. Whitten, Jr., R.T. Zuidema
Associate Professors: S.H. Ambrose, P.A. Garber,A. Gottlieb, C.M. Keller, L.L. Klepinger, R.B. Lewis, T.J. Riley, M. Saul, O. Soffer-Bobyshev
Assistant Professors: D.J. Brewer, G.G. Pope, H.I. Silverman
Emeritus Professors: H.A. Gould, J.C. McGregor, D.B. Shimkin

Graduate Degree Programs. The Department of Anthropology offers graduate work leading to the master of arts and the doctor of philosophy degrees.

Admission. Students without the equivalent of this department's undergraduate concentration may be admitted to either degree program, but will be required to make up deficiencies in their background in anthropology. The Graduate College admission requirements apply.

Master of Arts. The master's degree can be a first stage toward the doctorate or may be used by students wishing to apply a knowledge of anthropology to some related field. Candidates for the master's degree must complete at least 8 units of graduate credit and present a thesis or paper in lieu of a thesis acceptable to two members of the graduate faculty within the Department of Anthropology. At least 3 units must be at the 400 level, and 2 of these units must be in anthropology.

Doctor of Philosophy. Requirements for the PhD include 16 units of graduate course work beyond the MA, a preliminary examination administered by the student's advisory committee, and a final examination. The preliminary examination consists of a predissertation research paper, a proposal for doctoral research, and a written examination designed by the student's doctoral committee followed by a two-hour oral examination conducted by the same committee. The final examination is a defense of the doctoral thesis, which is also conducted by the student's doctoral committee. High proficiency in one or reading ability in two foreign languages is required; however, statistics, computer science, or similar expertise may be used to satisfy the requirements in place of one foreign language. Fieldwork is strongly recommended, although not required.

Research Interests and Facilities. Courses and individualized study provide broad coverage of sociocultural, linguistic, archaeological, and physical anthropology. The department provides special emphases in the analyses of state ideologies and cultural transformations; complex societies in transition; kinship and gender relationships; symbolism, cosmology, art, and religion; politics, economics, and ethnicity; language and culture; text and narrative; formal analysis and mathematical modeling; medical anthropology; agricultural origins, evolution, and development; hunter-gatherer adaptations; diet and nutrition; paleoecology and paleobiology; comparative and analytical osteology; and primate behavior and ecology. The department's Laboratory of Anthropology has constituent archaeological, paleoethnobotany, faunal analysis, human biology, stable-isotope, and ethnographic laboratories.

The department is the headquarters of the Illinois Archaeological Survey and offers summer field school training in archaeology. Departmental funds are available for graduate students' summer field research. An archaeology field school is held at various locations in Illinois and Kentucky (location varies from year to year). Graduate student programs are enriched by close departmental relationships with the interdisciplinary area studies centers on campus: Africa, East Asia and the Pacific, South and West Asia, Latin America and the Caribbean, and Russia and East Europe, and with the Afro-American Cultural Program, Women's Studies Program, Office of Women in International Development, World Heritage Museum, Museum of Natural History, Krannert Art Museum, Research Board, and International Programs and Studies.

The department recently ranked first in the United States in employment of graduates at the time of receiving doctorates. Formal agreements between the University and various governments and institutes facilitate research in many nations. Training is available in various languages, including Quechua, Japanese, Chinese, Russian, Indonesian, Thai, Burmese, Swahili, Hausa, Lingala, Wolof, Arabic, and Shona. Students have ready access to the extensive computer facilities of the University and to the department's facilities, which include microcomputers and mainframe computer terminals, a graphic digitizer, photographic equipment, video equipment, and other research-oriented equipment. The *Journal of the Steward Anthropological Society*, edited by graduate students, has been published since 1969.

ARCHITECTURE

Director of the School: R. Alan Forrester
Correspondence and Information: School of Architecture, University of Illinois at Urbana-Champaign, 106 Architecture Building, 608 East Lorado Taft Drive, Champaign, IL 61820

GRADUATE FACULTY

Director of the School: R. Alan Forrester
Professors: J.G. Albrecht, M.M. Ali, J.R. Anderson, B. Bognar, J.S. Garner, B.L. Hutchings, R.D. Katz, M.K. Kim, S.T. Lanford, W.H. Lewis, H.J. Miller, R.T. Mooney, A. Notaras, W. O'Connell, J.P. Warfield, H.C. White, D.J. Wickersheimer
Associate Professors: M.J. Andrejasich, K.H. Anthony, R.J. Betts, E.H. Clay, C.M. Dry, W.H. Erwin, L.A. Leffers, R.G. Ousterhout, H.S. Plummer, R.E. Schmitt, R.I. Selby, J.E. Simon, R.L. Smith, W.J. Voelker
Assistant Professors: P.J. Armstrong, K.J. Hinders, P.S. Kruty, A. Lapunzina, A. Marshall, T.J. Paulson, J.Poss

Graduate Degree Programs. The School of Architecture offers three graduate programs, each leading to the Master of Architecture degree: Track 1, a one-year program for students holding a five-year Bachelor of Architecture professional degree; Track 2, a two-year program for students holding a four-year Bachelor of Science in Architectural Studies (or similar degree in architecture); and Track 3, a program of variable length for students holding a bachelor's degree in any field other than architecture. Track 2 and Track 3 programs are professional degree programs accredited by the National Architectural Accreditation Board.

The School of Architecture, together with the Departments of Business Administration, Finance, Computer Science, Urban and Regional Planning, and Civil Engineering, offers graduate programs leading to the following dual degrees: Master of Architecture and Master of Business Administration, Master of Architecture and Master of Science in Finance, Master of Architecture and Master of Computer Science, Master of Architecture and Master of Urban Planning, and Master of Architecture and Master of Civil Engineering (Construction Engineering and Management).

Admission. Admission with full standing requires a preprofessional architectural degree equivalent to the four-year Bachelor of Science in Architectural Studies from the University of Illinois at Urbana-Champaign or a five-year Bachelor of Architecture professional degree. The admission grade-point average must be at least 4.0 (A = 5.0). For applicants who meet the degree requirements but have an admission grade-point average under 4.0, admission with limited standing may be permitted if evidence of exceptional qualifications is presented. Admission with limited standing may also be permitted for applicants holding a degree less than equivalent to a degree from the University of Illinois at Urbana-Champaign, provided that equivalency can be established through additional course work.

Applicants are ranked and selected on the basis of undergraduate academic performance measured by an admission average determined from official college transcripts, portfolio or brochure of applicant's past work in the architectural field, a statement of objectives, three letters of recommendation, and relevant professional work experience.

Master of Architecture (Track 1). Applicants who hold the five-year Bachelor of Architecture degree are considered to have earned the first professional degree. For them, a one-year degree program has been developed emphasizing further study in depth of one optional area of concentration, and/or participation in research identical to the final phase of the Track 2 graduate program.

Candidates admitted to the Track 1 graduate program must complete at least 8 units of graduate work. Candidates must spend at least two semesters and earn at least half of the required units in residence. Candidates admitted with full standing may complete the program in one full-time academic year of study.

Master of Architecture (Track 2). The two-year professional degree program, intended for students entering with a four-year baccalaureate in architectural studies, emphasizes further

study in architectural disciplines, study in depth in one optional area of concentration, and/or participation in research.

Advanced study in architectural disciplines, building upon the fundamentals established in a four-year undergraduate study program, constitutes the initial phase of the two-year graduate program. This initial phase is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of course work required of all candidates for the Master of Architecture professional degree.

Election of an optional area of concentration constitutes the final phase of the graduate program and allows students to devote two semesters of work to a specific field of their choice. The department offers optional areas of concentration in architectural design, architectural history and historic preservation, architectural management, architectural practice and technology, architectural structures, and architectural research, for which a research thesis is required.

Participation in or initiation of research is encouraged in the optional areas of concentration. For those qualified, many opportunities currently exist in departmental and interdepartmental areas. These include, among others, opportunities from the School of Architecture based on research grants from various external funding agencies; from Housing Research and Development, a unit of the Graduate College; and from the Small Homes Council—Building Research Council, a unit of the College of Fine and Applied Arts.

Candidates admitted with full or qualified standing to the two-year professional degree program must complete at least 15 1/2 units of graduate work. Candidates must spend at least four semesters and earn at least half of the required units in residence. Candidates admitted with full standing may complete the program in two full-time academic years of study.

Master of Architecture (Track 3). The variable-length professional degree program has been designed for applicants who have a bachelor's degree in any field other than architecture. Emphasis is placed on the development of sufficient background in introductory architectural studies so that the applicants may successfully complete the equivalent of the two-year graduate program described above.

Applicants accepted into the Track 3 program will initially be admitted with limited standing. Full standing may be attained by completion of introductory architectural studies. A minimum of 13 1/2 units of graduate work is required for completion.

The time necessary to complete the program will depend on the nature of undergraduate course work completed by the applicant and on the optional area selected.

Master of Architecture and Master of Business Administration, Master of Science in Finance, or Master of Computer Science. Three double master's degree programs related to the architectural management option prepare graduate degree candidates for the broad range of management activity now developing in architectural practice. Work in the architectural management option in one of these areas can lead to one of the following double master's degree combinations: Master of Architecture and Master of Business Administration, Master of Architecture and Master of Science in Finance, and Master of Architecture and Master of Computer Science.

For entry into one of these programs, applicants must satisfy the admission and performance requirements of each academic unit. Application for admission may be made simultaneously to both units, or admission to one unit may be sought after gaining entry to the other.

Candidates entering one of these double degree programs with a four-year baccalaureate in architectural studies must complete 21 1/2 units of graduate work, except that the combination of Master of Architecture and Master of Computer Science degrees requires 18 1/2 units plus 9 semester hours of prerequisites in computer science. If admitted with full standing, students can complete the program in five semesters. Candidates entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters.

Master of Architecture and Master of Urban Planning. This double degree program offers an opportunity to obtain an education for a career that combines the disciplines of architecture and planning. The program requires a match up of related subject areas from the two departments in order to meet the requirements for each degree. These areas include: housing/community development, preservation/preservation planning, and urban design/environmental planning

and land use. For entry into this program, applicants must satisfy the admission requirements of each academic unit. Application for admission may be made either simultaneously to both units or in sequence.

Candidates entering the program with a four-year baccalaureate in architectural studies must complete at least 20 1/2 units of graduate work and, if admitted with full standing, may complete the program in six semesters and one summer session. Candidates entering the program with a five-year Bachelor of Architecture degree must complete at least 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters and a summer session.

Master of Architecture and Master of Civil Engineering (Construction Engineering and Management). This double degree program offers qualified applicants the opportunity to develop competence in a career that combines the disciplines of architecture and civil engineering (construction engineering and management). For entry into this program, applicants must satisfy the admission and performance requirements of each academic unit. Application for admission should be made to the School of Architecture. Admission to the other unit may be sought after the first semester of graduate study in architecture.

Candidates entering the program with a four-year baccalaureate in architectural studies must complete at least 21 1/2 units of graduate work and, if admitted with full standing, may complete the program in five semesters. Candidates entering the program with a five-year Bachelor of Architecture degree must complete 16 units of graduate work and, if admitted with full standing, may complete the program in four semesters.

Financial Aid. Financial aid for graduate students in architecture is available in the form of fellowships, teaching and research assistantships, and tuition and partial fee waivers. Qualified candidates are considered for financial support upon application.

ARMS CONTROL, DISARMAMENT, AND INTERNATIONAL SECURITY

Faculty Director: Jeremiah D. Sullivan

Correspondence and Information: Program in Arms Control, Disarmament, and International Security (ACDIS), University of Illinois at Urbana-Champaign, 330 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801

Graduate Programs. Courses developed and taught by faculty associated with the ACDIS program offer credit through departments, area studies centers, or colleges of the University. Courses within the program are offered by faculty from the following departments or colleges: anthropology, astronomy, clinical medicine, comparative literature, history, law, philosophy, physics, political science, psychology, and nuclear engineering. The program consists of five units: the Regional Security Project, the Science and Technology Group, the Ethical Studies Group, the War in History Unit, and the European Arms Control and Security Project.

Financial Aid. Through funding from the John D. and Catherine T. MacArthur Foundation and the Ford Foundation, ACDIS offers beginning graduate student fellowships, research assistantships, and dissertation fellowships. All graduate fellowships and assistantships provided by ACDIS are accompanied by a tuition and service fee waiver provided by the Graduate College.

ART AND DESIGN

(Including Art Education, Art History, Ceramics, Glass, Graphic Design, Industrial Design, Metals, Painting, Photography, Printmaking, and Sculpture)

Director: Ted Zernich

Correspondence and Information: D. Pilcher, Coordinator of Graduate Programs, School of Art and Design, University of Illinois at Urbana-Champaign, 120 Art and Design Building, 408 East Peabody Drive, Champaign, IL 61820

GRADUATE FACULTY

Professors: M. Arends, R. Blakley, W. Carlson, D. Colley, P. Fagan, J. Fineberg, M. Franciscono, F. Gallo, L. Grucza, G. Hardiman, T. Kovacs, H. Maguire, C. Martens, B. Nettles, D. Pilcher, D. Rowan, S. Sato, J. Savage, D. Socha, E. Wicks, A. Wroblewski, B. Youngman, T. Zernich, J. Ziff

Associate Professors: D. Bushman, K. Carls, J. Chardiet, D. Cox, A. Glaze, A. Hedeman, E. Hostetter, R. Kotoske, S. Krepp, E. Lancaster, K. Manthorne, A. Mette, D. Moses, P. North, S. Orso, J. Rascheff, C. Stephens, B. Theide, T. Van Laar

Assistant Professors: B. Bendl, K. Chmelewski, B. Delacruz, N. Goggin, G. Guthrie, B. Kendrick, R. Kovatch, P. Kursel, E. Maguire, L. Robbennolt, D. Ryan, R. Schwartz, E. Scott, R. Springfield, J. Squier, T. Thompson, J. Wood

Graduate Degree Programs. The School of Art and Design offers the Master of Arts in Art Education and in Art History, the Master of Fine Arts, the Doctor of Education in Art Education, and the Doctor of Philosophy in Art History. The Graduate College admission requirements apply for all programs.

Master of Arts in Art Education. The program of study leading to the degree of Master of Arts in Art Education is designed to provide advanced professional preparation for art teachers and supervisors. A minimum of 8 units of study is required for the degree. Three units must be taken at the 400 level, all of which must be in art education graduate seminars. In addition to professional courses in art education, students may elect course work in drawing, painting, sculpture, papercasting, printmaking, photography, cinematography, ceramics, glassworking, metalsmithing, and art history. Specific course selection is determined in consultation with the student's adviser. No thesis is required. While a majority of applicants to this program hold valid teaching certificates, applicants with certification-related deficiencies may be admitted to the program. However, graduate credit cannot be granted for courses taken to make up such deficiencies. Candidates must spend at least two semesters or the equivalent in residence. Applicants currently employed as teachers may apply for residence credit for summers-only enrollment.

Master of Arts in Art History. This program provides basic preparation for teaching at the college level, background in the history of art for museum work, and preliminary study for the doctoral degree. In addition to the general requirements, the prerequisite for admission is ordinarily an undergraduate degree in art history or a strong preparation in related humanistic studies. Applicants with little background in art history but who have done exceptionally well as undergraduates in other disciplines will be seriously considered. A minimum of 8 units is required for the degree. At least 6 units must be in the history of art and architecture, of which at least 4 units must be in art history graduate seminars. For those interested in art museum training, special courses in museum studies are offered by the staff of the Krannert Art Museum. Proficiency in French or German must be demonstrated by the end of the first year of residence. Before the degree is conferred, candidates are required to pass an examination on the general field of art history. A thesis is required.

Master of Fine Arts. The degree of Master of Fine Arts in Art and Design with fields of specialization in ceramics, glass, graphic design, industrial design, metals, painting, photography, printmaking, and sculpture is designed to prepare qualified individuals for distinctive achievement in the professional area of their choice. Applicants should clearly indicate the

intended specialization on the application for admission. A minimum of 16 units of graduate credit is required for the MFA degree. Individual studio space and specialized resources essential to the acquisition of a high-quality professional education are available to students in all areas of study. A graduation exhibition of creative work is required. Candidates must spend a minimum of four semesters or the equivalent in residence.

Admission is determined by a faculty review of portfolio, records of previous education and experience, letters of recommendation, and other significant achievements that may be viewed as predictors for success in the program.

Doctor of Education in Art Education. The program leading to the degree of Doctor of Education in Art Education is designed to prepare qualified art educators for careers in college-level teaching and research. Applicants for admission must hold a master's degree in art education or the equivalent from an accredited institution. A minimum of two years of acceptable teaching experience is required. Admission is determined by examinations, personal interviews, records of previous education and experience, and letters of recommendation. Applicants should present credentials well in advance of their first registration. A minimum of 16 units of course work beyond the master's degree is required.

Doctor of Philosophy in Art History. The program leading to the degree of Doctor of Philosophy in Art History is designed to prepare students for scholarship and for teaching at the college level. Applicants must have the Master of Arts in Art History or the equivalent. Students earning the master's degree at the University of Illinois at Urbana-Champaign must pass the qualifying examination with a high score and write a thesis or research paper of superior quality in order to be admitted to the doctoral program. Students taking the master's degree elsewhere must satisfy the Graduate Committee on the History of Art and Architecture as to their preparation to undertake work on a doctoral level. Students must have a reading knowledge of French and German. Students usually elect to specialize and write a thesis in one of various fields, including Medieval, Renaissance, Baroque, Modern, American, and Oriental. In addition, students elect a minor in another art history field.

Resources. Resources for graduate students in art and design include the Krannert Art Museum's excellent permanent collections and changing exhibitions; the Ricker Library of Art and Architecture, one of the largest art and architecture libraries in the nation; the Krannert Center for the Performing Arts; the Center for Graphic Technologies, which includes state-of-the-art computer and printing facilities; and a variety of lectures, symposia, musical programs, dramatic productions, and other cultural events associated with a large and progressive university.

Financial Aid. Fellowships, assistantships, and tuition and service fee waivers are awarded each year on a competitive basis, with consideration given to the applicant's grade-point average and, in the case of applicants for the MFA programs, quality of creative work.

ASIAN STUDIES

(Including Arabic, Burmese, Chinese, Hebrew, Hindi, Indonesian, Japanese, Korean, Persian, Sanskrit, Thai, and Turkish)

Correspondence and Information: East Asian, Southeast Asian, and Pacific Studies: Department of East Asian Languages and Cultures, University of Illinois at Urbana-Champaign, 608 South Mathews Avenue, Urbana, IL 61801; South and West Asian Studies: Program in South and West Asian Studies, University of Illinois at Urbana-Champaign, 381 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Accad, N. Aggarwal, P.R. Balgopal, E.M. Bruner, C. Capwell, C.C. Cheng, S.P. Cohen, C.E. Cunningham, L.E. Eastman, P.B. Ebrey, E. Giles, T.R.H. Havens, J. Hill, H.H. Hock, T. Hymowitz, B. Kachru, Y. Kachru, J.D. Keller, C.W. Kim, B.B. Kling, F.K. Lehman,

C.I. Mulhern, B. Nettl, D.W. Plath, G.G. Porton, S. Rashid, S. Sato, P. Schran, C.C. Stewart, K. Taira, G.L. Tikku, R.P. Toby, M.G. Weinbaum, M.E. Weinstein, G.T. Yu

Associate Professors: B. Bognar, D.M. Desser, S.A. Douglas, D.G. Goodman, J.K. Haboush, R.C. Jennings, S. Johnson, W.L. MacDonald, H.P. Maguire, K. Munakata, J. Peterson, T.J. Riley, M.M. Saul, M.M. Shorish, K.E. Southwood, M. Wagner

Assistant Professors: N.A. Abelmann, K.W. Chow, A.P. Elhance, P.N. Gregory, J.E. Hanes, V.J. Hoffman-Ladd, J.L. Packard, D.A. Pan, R. Pandharipande, W.T. Pitard, L.J. Unnevehr

Graduate Degree Program. The Department of East Asian Languages and Cultures administers, in cooperation with the Program in South and West Asian Studies where applicable, a two-year program of language and area courses leading to the master of arts degree with regional concentrations in East Asia, the Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for students intending to proceed to the PhD degree in a related field and for students preparing for a career not requiring the doctorate. The Department of East Asian Languages and Cultures also administers a graduate minor in Asian studies in cooperation with various departments, allowing graduate students electing this minor to concentrate on East Asia, the Middle East, South Asia, or Southeast Asia, or a combination of two or more of these areas.

Admission. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois at Urbana-Champaign, but final selection is determined by a committee of center faculty members. Students whose native language is not English must score at least 600 on the TOEFL to be eligible for admission at full graduate standing. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. Students entering without any prior training or experience, however, may be required to take, without credit toward the degree, such work as the adviser may deem necessary to make up any deficiencies.

Master of Arts. Candidates must complete 9 units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by satisfactory completion of an examination or appropriate course work, pass an oral examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers. No thesis is required.

Minors in Asian Studies. Candidates for a master's degree who elect Asian studies as a minor must earn at least 2 units of graduate credit in approved courses in at least two departments outside the major department.

Doctoral candidates who elect Asian studies as a minor must earn at least 4 units of graduate credit in approved courses in at least two departments outside the major department. Also, before the completion of course requirements for the degree, doctoral candidates must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Chair of the Department: Ronald F. Webbink

Correspondence and Information: Department of Astronomy, University of Illinois at Urbana-Champaign, 103 Astronomy Building, 1002 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.M. Crutcher, J.R. Dickel, I. Iben, Jr., J.B. Kaler, F.K. Lamb, K.-Y. Lo, D. Mihalas, T. Ch. Mouschovias, E.C. Olson, L.L. Smarr, L.E. Snyder, J.W. Truran, W.D. Watson, R.F. Webbink, K.M. Yoss

Associate Professors: H.R. Dickel, S.A. Lamb, M. Norman, E.C. Sutton, L.A. Thompson

Emeritus Professors: J.H. Cahn, S. Rosen, G. Swenson

Graduate Degree Programs. The Department of Astronomy offers graduate work leading to the master of science and doctor of philosophy degrees. The goal of the graduate program in astronomy is to provide broadly based training in modern astrophysics and astronomy for a small and carefully selected student body. Individually designed programs involving close contact with faculty members are encouraged, and an understanding of fundamental principles and techniques and their applications to research problems of current interest is emphasized. Students are expected to acquire a solid knowledge of modern physics as well as of general astronomy. A major objective is to maintain an exciting intellectual environment in which students can develop their scientific creativity and their enthusiasm for astronomy.

Admission. Admission decisions are made once a year in the spring. Applications for admission and financial assistance must be received by February 15. Normal entrance requirements are a bachelor's degree in astronomy, physics, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. A minimum grade-point average of 4.0 (A = 5.0) and satisfactory scores on the Graduate Record Examination (verbal, quantitative, and advanced physics portions) are requisites for admission. Financial assistance is usually provided to graduate students.

Master of Science. For the MS degree, 8 units of study in graduate courses are required. There are no thesis or foreign language requirements. The 8 units of course work may not include any research units (such as 490, 497, 499) except 1 unit of 491. At least 4 units must be in astronomy 400-level courses, 2 of which will be in Theoretical Astrophysics 402 and in Observational Astronomy 403. The remaining 4 units must be selected from approved courses in astronomy, physics, or mathematics, with at least 1 of these units in a 400-level course.

Doctor of Philosophy. The PhD degree requires completion of 24 units in courses in astronomy and related fields (at least 8 of which involve individual study and research), satisfactory performance on a general qualifying examination no later than the beginning of the third year of study, demonstrated reading ability in one foreign language useful for astronomical work, and completion of an original research project culminating in a thesis publishable in whole or in part. Further information on exact degree requirements may be obtained from the department.

Faculty Research Interests. Research activity includes astrophysical fluid dynamics and theory of star formation; radiation hydrodynamics; observational and theoretical investigation of the solar system (comets, planets, cosmochronology); stars (stellar structure and evolution, gravitational collapse, nucleosynthesis, novae, supernovae, stellar atmospheres, binaries, stellar statistics, pulsars); the interstellar medium (planetary nebulae, molecular clouds, cosmic rays, supernova remnants, galactic structure); extragalactic systems (galaxies: their structure, evolution, and dynamic behavior; quasars); and cosmic magnetic fields.

Astrophysics is also a strong research interest of about six faculty members in the Department of Physics. Current activity in physics centers on the physics of neutron stars, white dwarfs, compact X-ray sources, and supernova ejecta, with broad-ranging interests in the application of modern physics to astronomy. Students in astronomy may select thesis supervisors from faculty members in the Department of Physics as well as in the Department of Astronomy.

Research Facilities. The department has a share in a millimeter radio-interferometer system in Northern California (being developed jointly with UC Berkeley and Maryland). A 40-inch-diameter reflecting telescope equipped with a CCD, located on Mt. Laguna in Southern California, is operated jointly with San Diego State University, which also operates 16-inch and 24-inch telescopes occasionally used by University of Illinois faculty and students. Transportation costs are usually provided. The department also purchases time on optical telescopes operated by other universities. Both optical and radio astronomers frequently obtain observing time on telescopes at national observatories at Kitt Peak, Cerro Tololo, Green Bank, and Socorro. Computations are performed on a variety of university computers, including an IBM 3081 and Convex C-240, accessed via remote terminals in the Department of Astronomy. Simultaneous time sharing and batch processing with unusual speed are features of the computational system,

which is among the most advanced university-based systems in the nation. A local area network (LAN), including Sun 4 and SPARC workstations and fileservers for interactive image processing, is available in the department. This LAN also provides access to the Cray-2, Cray Y-MP, and Connection Machine supercomputers at the National Center for Supercomputing Applications on the campus. These computers are used for production data processing (radio synthesis imaging), as well as for theoretical modeling.

Financial Aid. University fellowships are available and may be combined with part-time teaching assistantships. Most resident students are supported for their first two or three years by half-time teaching assistantships. The typical teaching assistant takes three graduate courses per semester and spends twenty hours per week handling quiz sections in elementary astronomy courses. Teaching assistantships are responsible positions, and the concomitant duties are considered to be a valuable part of the student's educational experience. Advanced students may compete for research assistantships offered by faculty members whose research is partially supported by federal grants.

ATMOSPHERIC SCIENCES

Head of the Department: M. Mak

Correspondence and Information: Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, 101 Atmospheric Science Building, 105 South Gregory Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: K.V. Beard, P.J. Lamb,* M. Mak, T. Sasamori, M. Schlesinger, J.E. Walsh, R.B. Wilhelmson

Assistant Professors: K.P. Bowman,* M. Ramamurthy, R.M. Rauber, W.A. Robinson

*Adjunct faculty

Graduate Degree Program. Graduate programs leading to the master of science and doctor of philosophy degrees are offered.

Admission. Applicants for admission to this program must satisfy the general requirements for admission to the Graduate College. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied mathematics. There is no foreign language requirement.

Master of Science. The requirements for the degree of Master of Science in Atmospheric Sciences correspond to the general requirements of the Graduate College for the MS degree, with the additional requirement of a minimum of 4 units to be taken in graduate courses in atmospheric sciences, excluding the thesis (499). Therefore, the total requirements are 8 units, 3 of which must be from courses numbered in the 400 series and 4 of which must be in atmospheric sciences. A written thesis, which may account for 1 or 2 units of credit, is also required. Further information on exact degree requirements can be obtained from the department.

Doctor of Philosophy. All candidates for the PhD degree must satisfy the general requirements of the Graduate College and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet that may be obtained from the department.

Research Interests. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the physics of aerosol and precipitation; precipitation chemistry; observational, theoretical, and modeling studies of clouds and severe storms; synoptic and mesoscale meteorology; numerical weather

prediction; weather modification; four-dimensional data assimilation; stratospheric dynamics; low-frequency variability; nonlinear atmospheric dynamics; climate variability and climate modeling; atmospheric radiative processes; ozone climatology; radar and satellite meteorology.

Research Facilities. Current weather information is available for teaching and research. Weather facsimile charts are received continuously from the National Weather Service, and satellite imagery is received hourly through the department's UNIFAX II GOES receiver.

The department has excellent computing facilities. The two primary departmental computers are Hewlett-Packard 730 and 8355, which are high-performance minicomputers with a graphics accelerator and high-resolution color display. The HP-8355 is used for general-purpose computing and data display. The HP-730 is used principally for collecting, analyzing, and displaying real-time weather data for teaching and research. Laser printers and color film recorders are available for output. The department also has a large number of terminals, Macintosh personal computers, and workstations available to students and faculty. All of the computers in the department are connected to the departmental network and to a high-speed, campuswide, fiber-optic network. It provides access to other computers on and off campus, such as those operated by the University (an IBM 3081 and a CONVEX 220) and those operated by the National Center for Supercomputing Applications (Cray-YMP, Cray-2, and a Connection Machine) located on campus. The campus network also has satellite and land links to national and international networks, including the computing facilities of the National Center for Atmospheric Research (NCAR). NCAR maintains two Cray supercomputers and has comprehensive atmospheric data sets for support of research.

Financial Aid. Financial aid is available in the form of research and teaching assistantships, University fellowships, and waivers of tuition and service fees.

BIOENGINEERING

Chairman of Bioengineering: Richard L. Magin

Correspondence and Information: Bioengineering Office, University of Illinois at Urbana-Champaign, 164 Mechanical Engineering Building, 1206 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: L. Barr, S.D. Brown, J.C. Chato, H.S. Ducoff, F. Dunn, A.S. Feng, L.A. Frizzell, B.M. Hannon, S.I. Helman, E.G. Jakobsson, D.A. Lauffenburger, P.C. Lauterbur, R.L. Magin, W.D. O'Brien, Jr., S.I. Stupp, J.C. Thurmon, A.R. Twardock, W.C. Wagner

Associate Professors: P. M. Best, R.B. Clarkson, K.R. Holmes, N.R. Miller, M.H. Moeinzadeh, B. Oakley II, G.J. Pijanowski, M.R. Simon, B.C. Wheeler

Assistant Professors: W.A. Airth-Kindree, Y. Bresler, M.D. Chambers, R.M. Fish, D.P. Lawrance, W.A. Olson, G.E. Riccio, M.G. Strauss, K.D. Wittrup

At this time, no graduate degree is offered in bioengineering. However, courses and research opportunities are currently offered in the following units: chemical engineering, electrical and computer engineering, general engineering, kinesiology, materials science and engineering, mechanical and industrial engineering, the College of Medicine, physiology and biophysics, rehabilitation education, theoretical and applied mechanics, veterinary biosciences, veterinary clinical medicine. Students interested in bioengineering graduate work should contact either the Bioengineering Office or the degree-granting department most nearly matching their interests.

BUSINESS ADMINISTRATION

Head of the Department: Frederick W. Winter

Correspondence and Information: PhD and MSBA: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820; MBA: MBA Program Office, University of Illinois at Urbana-Champaign, 315 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: C.E. Blair, R. Engelbrecht-Wiggans, R.V. Evans, D.M. Gardner, R.M. Hill, H. Hinomoto, A.S. Huff, J.W. Kindt, P. Lansing, K. Monroe, J.K. Murnighan, G.R. Oldham, D.M. Roberts, K.M. Rowland, S. Sudman, H. Thomas, D.A. Whetten, F.W. Winter

Associate Professors: S.I. Cohen, I.H. Duhaime, J.F. Hennart, H. Leblebici, G.E. Monahan, J.F. Porac, Z. Ritz, M.E. Roszkowski, M.J.P. Shaw, D. Sudharshan, M. Tang

Assistant Professors: E. Coupey, D. Chhajed, M. Farjour, F. Jourden, C. Kulik, M.L. Leatherwood, B.S. Liu, J. Mahoney, N. Raman, R.A. Sanchez, C. Simmons, T. Smunt, M. Viswanathan, J. Yu

Graduate Degree Programs. The Department of Business Administration offers the Master of Science in Business Administration (MSBA) and the Doctor of Philosophy (PhD) in Business Administration. The College of Commerce and Business Administration offers a degree program leading to the Master of Business Administration (MBA). Joint professional degrees are offered with Architecture (MArch/MBA), Law (JD/MBA), Medicine (MD/MBA), Engineering (MSEE/MBA, MSIE/MBA, MSME/MBA, MSGE/MBA), and Computer Science (MCS/MBA). Students may also earn a BA in Liberal Arts and an MBA or a BA in Agriculture and an MBA.

Admission. Admission to the graduate business programs is dependent upon an undergraduate degree with a scholastic average of at least B for the last 60 hours, acceptable scores on the Graduate Management Admission Test (GMAT), three letters of recommendation, and a statement of career goals. The average GMAT for the fall 1991 MBA class was 590; the average grade-point average was 4.4 (A = 5.0).

Applicants for all programs whose native language is not English are also required to submit scores from the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE). A minimum score of 600 must be achieved on the TOEFL and a minimum score of 200 on the TSE.

The master's programs can be started in August only. The PhD program may be started in August or January; however, August is the preferred semester of entry. The application deadline is May 1 for the MBA program, March 15 for the MSBA and August PhD programs, and October 1 for January PhD admission.

Master of Business Administration. The MBA degree is a general degree, the purpose of which is to prepare graduates to assume managerial positions. This course of study is to be integrated with other technical and professional skills. The program requires 18 units, which students complete in two years. The program begins in the fall semester and is offered on a full-time basis only. Students may have undergraduate degrees from any area of study.

The eighteen-course program is comprised of twelve core courses (six from the fundamental areas of behavioral, economic, and quantitative sciences; six from the functional areas of accounting, marketing, finance, production, operations, law, and policy and planning) and six electives. No evening or correspondence courses are offered. No exemptions or transfer credits are allowed.

Students may select electives from one specific area or a number of different areas. Some suggested elective areas include decision and information sciences, international business, finance, marketing, accounting, organizational behavior, entrepreneurship, production and operations management, economics, and strategy and policy. Other elective areas include health care management, food and agribusiness management, and the management of technology.

All MBA students must complete a semester-long, noncredit computer competency sequence offered through the Office for Information Management. The sequence is offered on

Fridays during the fall semester of the first year. Students are provided with hands-on training in management tools of the profession, such as electronic mail, word processing, spreadsheet, data base management, and business graphics.

All MBA students must also attend noncredit communication skills development workshops. Weekly meetings are held throughout the first year. Workshops include sessions on active listening, problem solving, job-interviewing strategies, making formal presentations, and leadership and interactive skills.

A two-year Executive MBA program is offered to experienced managers. Details may be obtained from the Executive MBA Program, 218 Commerce West, 1206 South Sixth Street, Champaign, IL 61820.

Juris Doctor and Master of Business Administration. The JD/MBA program promotes careers in which administration and law overlap, such as corporate and trust law. Students in this program complete at least 74 hours of law courses and 12 units of business courses. For more information on the JD degree, write to Admission Officer, 207 Law Building, 504 East Pennsylvania Avenue, Champaign, IL 61820.

Master of Architecture and Master of Business Administration. The MArch/MBA program is designed to provide training for careers in which management and architecture overlap. This joint program enables students to fulfill the requirements for both degrees by completing a total of 21 1/2 units, 12 of which are in business administration. For more information on this degree, write to Graduate Admission Officer, 117 Architecture Building, 608 East Lorado Taft Drive, Champaign, IL 61820.

Doctor of Medicine and Master of Business Administration. The MD/MBA program is designed for medical doctors who anticipate administrative responsibilities. In addition to the requirements for the MD degree, the program requires 12 units in business administration. Students can finish the program in four full years, including three summers. For more information on the Medical Scholars Program, write to Coordinator of the Medical Scholars Program, 1210 West California Street, Urbana, IL 61801.

Master of Science in Electrical Engineering and Master of Business Administration. The MSEE/MBA program encourages careers in professional engineering and the management of technology. Students in the joint program must complete a total of 18 units, 14 of which are in business administration. For more information, write to Admission Officer, Department of Electrical and Computer Engineering, 155 Electrical Engineering, 1406 West Green Street, Urbana, IL 61801.

Other Engineering Joint Degree Programs. The Master of Science in Industrial Engineering/Master of Business Administration program (MSIE/MBA), the Master of Science in Mechanical Engineering/Master of Business Administration program (MSME/MBA), and the Master of Science in General Engineering/Master of Business Administration program (MSGE/MBA) were created in response to a growing demand for industrial, mechanical, and general engineers who are also professional managers. The MSIE/MBA and MSME/MBA programs require a total of 20 units, 12 of which are in business administration. The MSGE/MGA program requires 18 units, 12 of which are in business administration. For more information on the MSIE/MBA or MSME/MBA, write to Graduate Programs Office, 210a Mechanical Engineering Laboratory, 1206 West Green Street, Urbana, IL 61801. For more information on the MSGE/MBA, write to Graduate Admissions, 117 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801.

Master of Computer Science and Master of Business Administration. The MCS/MBA allows students to earn both degrees in three years instead of the usual four. The program serves the application-minded computer scientist who seeks management skills. Requirements include 12 units from business administration and 9 units from computer science. For more information, write to Graduate Admissions, 114 Digital Computer Laboratory, 1304 West Springfield Avenue, Champaign, IL 61820.

Bachelor of Arts in Liberal Arts/Master of Business Administration and Bachelor of Arts in Agriculture/Master of Business Administration. These programs allow students to earn two degrees in five years rather than the usual six. The programs integrate an undergraduate

education with a professional education without diluting the quality or purpose of either. Through careful course selection and program planning, students complete the first year of the MBA program during their senior year. This course work counts toward both degrees. Students complete remaining MBA program requirements during their fifth year. For more information on the BA in Liberal Arts/MBA program, write to 270 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801. For more information on the BA in Agriculture/MBA program, write to 101 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801.

Master of Science in Business Administration. The Master of Science in Business Administration is a 10- to 12-unit master's program best suited for those with a strong technical expertise in one of the concentrations offered within the PhD program. The focus is on preparation for advanced study in the doctoral program or for a research-oriented position. The course work can usually be completed in four semesters. The program core consists of three areas of study: quantitative methods, behavioral science, and economics. These courses integrate, in the major functional areas, contributions of the qualitative, social, and behavioral sciences to administrative decision making. A major must be specified from one of five areas offered within the Department of Business Administration: organizational behavior, business policy, marketing, international business, and decision and information science. A minor is required as well and can be chosen from another area within the Department of Business Administration or a related area outside the department or college. Admission to the program is highly selective.

Master of Science in Business Administration for International Managers. The MSBA for International Managers is a fourteen-month master's degree program designed to meet the management development needs of organizations involved in international business. It is intended for experienced international managers and administrators who want to earn an advanced degree while gaining valuable experience in the world of American business. Students typically are experienced managers who possess unusual potential for future achievement in international business. Those who wish to specialize in a functional area may extend their program to two years.

In addition to formal course work, students participate in a series of management development seminars, which provide an overview of American business concepts and practices. Business and industry field trips, seminars with American executives, and other special activities provide another dimension to the program. A conference at which students present papers on topics of special interest is held at the conclusion of the program.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration. Doctoral students can specialize in marketing, organizational behavior, decision sciences, operations management, information systems, international business, and strategic management and policy. The program is intensive, flexible, and adapted to individual needs.

Each student's program entails sufficient study and preparation to achieve the following: (1) competence in a common core covering substantive and research methods courses, which are formulated by the faculty in each area; (2) in-depth expertise in a major area; (3) expertise in at least one area in addition to the chosen major area, with this minor area selected from within or outside the department; (4) teaching competence; (5) research or problem-solving competence.

Competency is determined by comprehensive written and/or oral examinations. Following successful completion of all course work and comprehensive examinations in major and minor areas, students must propose and gain approval of a thesis topic at a public colloquium. The final program requirement is the successful oral defense of the thesis.

For persons entering the program from an undergraduate program, the minimum requirements are 16 course units and 8 thesis units. Persons entering with a master's degree in business generally will need a minimum of 8 course units and 8 thesis units. The program usually is completed in four years, although students with a master's degree in business may require only three years.

International Programs. The department has worked with various language and social science faculty members to design master's and doctoral program options that address education for the growing internationalization of business. These are suited particularly for undergraduates prepared in foreign languages and cultures, international economics, and politics.

Residence Requirement. Master's degree candidates must maintain continuous full-time registration through the completion of their course work. PhD candidates must maintain continuous registration through the approval of a dissertation proposal, unless a leave has been approved by the department.

Research Interests. Faculty research interests are in the areas of marketing, organizational behavior, decision and information sciences, strategic planning and business policy, international business, accounting, economics, entrepreneurship, and finance. The College of Commerce and Business Administration houses computer facilities, a behavioral science laboratory, and a separate library. The college maintains contacts with industry and government through its Executive Development Center, Executive-in-Residence Program, Survey Research Laboratory, Bureau of Economics and Business Research, and several professional and scholarly journals edited by its faculty.

Financial Aid. One fellowship and several scholarships are offered to first-year MBA students. Students are eligible for teaching or research assistantships at the beginning of the second year of the program.

Most PhD students receive some form of financial assistance. This assistance is likely to be in the form of a teaching or research assistantship, which includes a waiver of tuition and most service fees, and/or the award of a merit-based fellowship.

CHEMICAL PHYSICS

Head of the Department of Chemistry: Larry R. Faulkner
Head of the Department of Physics: Ansel C. Anderson
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801. Students with undergraduate degrees in physics should direct inquiries and applications to the Head, Department of Physics, University of Illinois at Urbana-Champaign, 211 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, IL 61801.

Graduate Degree Programs. A chemical physics program leading to the doctor of philosophy makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Fundamental research on many properties of molecular and solid-state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department. Students may use the facilities in both the School of Chemical Sciences and the Department of Physics.

Admission. Graduate College admission requirements apply. To be considered for admission, applicants should have an undergraduate degree in chemistry or physics with a strong background in the major field of chemistry or physics and more than the usual training in the other area. Those who received their degree in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degree in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study.

Doctor of Philosophy. In addition to taking a series of appropriate courses determined mainly by their research interests, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). In addition, students must pass an oral preliminary examination concerned with their preparation for doing research. Research for the thesis is performed under the direction of faculty members who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students

from the Departments of Physics, Chemistry, Metallurgy, Ceramic Engineering, Electrical Engineering, and other related departments that have common interests in materials science.

Financial Aid. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School: Jiri Jonas
Associate Director of the School: John P. Hummel
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of master of science and doctor of philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments and yet retain the advantages of a common approach to overlapping concerns. Service facilities, technical shops, and a placement office are provided by the school. Support for graduate training is available in the form of assistantships, traineeships, and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department or from the director of the school.

Biochemistry

Head of the Department: Robert L. Switzer
Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 401 Roger Adams Laboratory, 1209 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.E. Cronan, R.B. Gennis, M. Glaser, R.I. Gumport, L.P. Hager, A.F. Horwitz, A.M. Jonas, D.J. Shapiro, S.G. Sligar, R.L. Switzer
Associate Professors: G.W. Ordal, M.A. Schuler, A.J. Ward, J.A. Wise
Assistant Professors: A.S. Belmont, T.L. Karr, D.M. Kranz

Graduate Degree Programs. The Department of Biochemistry offers graduate work leading to the master of science and the doctor of philosophy degrees. For an application and departmental materials that provide greater detail on programs, offerings, admission, degree requirements, and financial aid, write to the above address.

Admission. Candidates for admission to the MS and PhD programs must have bachelor's degrees from accredited institutions equivalent to those from the University of Illinois at Urbana-Champaign. Courses required for admission are organic and physical chemistry, biology, a year of physics, and mathematics through calculus. Students with a weakness in any of these areas may be required to make up deficiencies during their graduate study. A grade-point average of 4.0 or higher (A = 5.0) for the last 60 hours of undergraduate work and for any graduate study is required for admission. It is strongly recommended that students take the Graduate Record Examination (both the aptitude test and the advanced test in biochemistry, chemistry, or biology). Emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. Specific degree requirements for the Course Work MS and the Thesis MS in Biochemistry include the successful completion of $4^1/_2$ units of biochemistry courses. A course

work master's degree requires a minimum of two full-time semesters and involves 8 total units of formal lecture and laboratory course work. At least 3 units must be in 400-level courses, and 2 of these 3 units must be in the major field. A thesis master's degree usually requires a minimum of three semesters; up to 3 of the 8 required units may be thesis research.

Doctor of Philosophy. Specific degree requirements for the PhD in Biochemistry include the successful completion of $4^1/_2$ units of biochemistry courses. An additional $3^1/_2$ units of advanced elective courses are also required for a minimum of 24 units including thesis credit. Students must also pass an oral research qualifying examination within the first eighteen months of residence and must successfully complete a series of written cumulative examinations. A thesis based on original research must be presented to a review committee at least two weeks before the final oral examination. The final examination is limited to a defense of the thesis research. Experience in teaching is considered a vital part of the graduate program and is required as part of the academic work of all PhD candidates in this department. There is no foreign language requirement for the PhD degree in biochemistry.

Specialization in Genetics.* The Department of Biochemistry offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Research Interests. The Department of Biochemistry is composed of faculty members whose research interests cover the major areas of current biochemical research and are united by a shared interest in biochemical regulatory mechanisms and structure-function relationships of biological macromolecules. The department offers major research programs in biophysics, protein chemistry, enzymology, nucleic acid structure, gene organization and expression, protein synthesis and degradation, virology, membranes, lipoproteins, cell surfaces, developmental biology, and hormone action.

Financial Aid. Financial aid for graduate students in biochemistry is available in the form of fellowships, teaching and research assistantships, and tuition and partial fee waivers. In addition, interdepartmental training grants from the National Institutes of Health support multidisciplinary training programs. Qualified candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally receive a stipend, as well as a full tuition waiver and a partial fee waiver.

**A proposal to establish a specialization in genetics is pending campus approval.*

Chemical Engineering

Head of the Department: R.C. Alkire
Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 114 Roger Adams Laboratory, 1209 West California Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.C. Alkire, H.G. Drickamer, T.J. Hanratty, R.I. Masel, W.G. May, A.J. McHugh, J.W. Westwater
Associate Professors: J.J.L. Higdon, M.A. Stadtherr, C.F. Zukoski
Assistant Professors: E.G. Seebauer, F.B. van Swol, K.D. Wittrup

Graduate Degree Programs. The Department of Chemical Engineering offers graduate work leading to the master of science and the doctor of philosophy degrees. Those interested should write to the address above for application materials and a departmental brochure, which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois at Urbana-Champaign. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with the understanding that their deficiencies will be removed to the extent prescribed by their advisers. Graduate College admission requirements also apply.

Master of Science. Requirements for the master of science include 8 units of graduate credit and a thesis. At least 5 of these units must be in courses other than thesis research; 2 of the 3 required 400-level units must be in chemical engineering courses.

Doctor of Philosophy. Requirements include 24 units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test usually taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: Gary B. Schuster
Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 106 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Beak, R.L. Belford, T.L. Brown, R.M. Coates, S.E. Denmark, L.R. Faulkner, H. Frauenfelder, R.B. Gennis, H.S. Gutowsky, J.P. Hummel, J. Jonas, J.A. Katzenellenbogen, W.G. Klemperer, P.C. Lauterbur, J.D. McDonald, E. Oldfield, I.C. Paul, W.H. Pirkle, T.B. Rauchfuss, K.L. Rinehart, K. Schulten, G.B. Schuster, D.H. Secrest, J.R. Shapley, S.G. Smith, K.S. Suslick, P.G. Wolynes
Associate Professors: P.W. Bohn, D.D. Dlott, G.S. Girolami, E.N. Jacobsen, J.M. Lisy, T.A. Nieman, A. Scheeline, P.A. Shapley, A. Wieckowski, S.C. Zimmerman
Assistant Professors: A.J. Gellman, A.A. Gewirth, N. Makri, J.V. Sweedler

Graduate Degree Programs. The degrees offered in chemistry are the Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. This catalog also provides information on a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 66) and on programs in biophysics (see page 122).

Admission. Students who have fulfilled the usual undergraduate course requirements, including at least 25 properly distributed semester hours in chemistry, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. A student who has completed graduate work in chemistry at another institution may be considered for admission if averages of 4.0 (A = 5.0) have been earned in both undergraduate and graduate work, or if a 4.25 average has been earned in at least 8 units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the teaching of chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree.

Master of Science in the Teaching of Chemistry. Candidates for the Master of Science in the Teaching of Chemistry must earn 4 units of credit in chemistry, 2 units in education, and 2 units of electives in either education or physical science. The 2 units in education consist of courses in educational policy studies and educational psychology (see page 80). The courses in chemistry and the electives must be selected with the approval of the adviser. No thesis is required.

Questions concerning the Teaching of Chemistry Program should be addressed to Professor D.H. Secrest, 316 Noyes Laboratory.

Master's Programs in Chemistry. Eight units of credit are required for the master's degrees. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A research thesis is optional. If a thesis is elected, 5 units of formal courses are required. If a thesis is not elected, an additional 3 units of formal courses are required. The course program in that case must include 3 units of 400-level courses, 2 of which must be in chemistry.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties, including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. A total of 24 units including thesis credit is required. The formal course requirements involve $2^1/_2$ to $3^1/_2$ units of 400-level courses in the major area of interest and 2 to 3 units in allied areas or fields. Besides completing formal course work, students are required to pass a series of written cumulative examinations, pass an oral preliminary examination on research preparation, and submit a thesis on original research, which is defended at a final oral examination. (Majors in organic chemistry must also demonstrate a reading knowledge of German.) Although teaching is not a general Graduate College requirement, this department requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

Financial Aid. Support for graduate students is available through fellowships and assistantships. All candidates are considered for these upon application. Graduate students making normal progress toward their degree generally receive a tuition waiver as well as a stipend.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering and Environmental Science in Civil Engineering)

Head of the Department: N.M. Hawkins
Correspondence and Information: Head, Department of Civil Engineering, University of Illinois at Urbana-Champaign, 1114 Newmark Civil Engineering Laboratory, 205 North Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.J. Barenberg, R.L. Berger, L.T. Boyer, S.H. Carpenter, E.J. Cording, M.I. Darter, B.J. Dempsey, R.H. Dodds, R.S. Engelbrecht, R.A. Eubanks, B.B. Ewing, D.A. Foutch, W.L. Gamble, J. Ghaboussi, G.R. Gurfinkel, W.J. Hall, J.D. Haltiwanger, W.W. Hay, A.J. Hendron, E.E. Herricks, M. Herrin, H.O. Ireland, H.M. Karara, N. Khachaturian, F.V. Lawrence, Jr., J.C. Liebman, L.A. Lopez, W.H. Maxwell, J.W. Melin, G. Mesri, W.H. Munse, J.P. Murtha, D.A. Pecknold, J.T. Pfeffer, B.E. Rittmann, A.R. Robinson, W.C. Schnobrich, C.P. Siess, V.L. Snoeyink, M.A. Sozen, J.E. Stallmeyer, W.H. Tang, M.R. Thompson, W.H. Walker, Y.K. Wen, H.G. Wenzel, Jr., K.W. Wong, B.C. Yen, J.F. Young
Associate Professors: D.P. Abrams, J.W. Eheart, K.D. Hjelmstad, J.H. Long, S.L. Paul, A.J. Valocchi
Assistant Professors: R.F. Benekohal, M.M. Clark, D.L. Freedman, M.H. Garcia, A.M. Ioannides, S.M. Larson, I.D. Parsons, M.J. Rood, S.P. Schneider, D.T. Shaw, T.D. Stark, L.J. Struble, S.L. Wood

Graduate Degree Programs. The Department of Civil Engineering offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering. The department also offers a joint degree: the Master of Architecture and Master of Science in Civil Engineering (construction management option).

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution; analysis and design of structures; application of artificial intelligence and expert systems techniques; aquatic ecology; behavior of structures; construction engineering and management; composite structures; computer-aided engineering systems; engineering risk, decision, and reliability analysis; environmental chemistry; environmental engineering and environmental systems analysis; fracture mechanics; geodetic engineering; highway engineering; hydrosystems engineering; hydrology, water resources, hydromechanics, and hydraulic structures; materials engineering; models research; nondestructive diagnostics; nuclear structural shielding; ocean engineering; ocean structures; photogrammetry and computer vision metrology; properties of structural materials: concrete, steel, timber, and others; rock mechanics; soil mechanics and foundations; solid waste management; stochastic structural dynamics and random vibrations; stream analysis; structural dynamics: design for earthquake, shock, blast excitation, and ocean waves; structural mechanics; system analysis and design; traffic engineering; transportation: planning, systems design, and operations; urban planning and management; wastewater treatment; water quality and treatment. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois at Urbana-Champaign, provided the applicant's preparation is appropriate to advanced study in his or her chosen major field. For additional information, see the departmental pamphlet, *Graduate Study and Research in Civil Engineering and in Environmental Engineering or Environmental Science in Civil Engineering.* In general, a 4.0 grade-point average (A = 5.0) for the last 60 hours of the undergraduate program and for any previous graduate work is a minimum requirement for admission to the MS program. Requirements for admission to the PhD program are variable, but are usually substantially higher. The Graduate Record Examination is not required but is highly recommended.

Master of Science. A master's program may be completed in one full-time academic year of study. Candidates for the master's degree must complete at least 9 units without a thesis or 8 units with a thesis. In the latter case, credit is given for thesis work. Three of the units must be in courses numbered in the 400 series, and 2 of these 3 must be taken for grades in the major field. A total of at least 4 units must be in the major field. There are no specific course requirements; individual programs are developed by the students in consultation with their academic adviser. At least half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign campus or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought. Although under certain conditions students holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time, usually they require an additional semester. There are no foreign language requirements in the MS program. The joint Master of Science with Architecture degree requires a minimum of 19 1/2 units with a thesis and 20 1/2 units without a thesis and can be completed in five semesters of full-time studies.

Doctor of Philosophy. The degree of doctor of philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. A minimum of 24 units beyond the bachelor's degree or 16 units beyond the master's degree is required. In accordance with Graduate College regulations, 16 units must be completed in residence. The major area of specialization encompasses courses and research that are closely related, but the courses need not be offered by a single major department. There is no departmentwide foreign language requirement. However, the faculties of some areas of specialization may require foreign language proficiency if essential to the conduct of research in that area. Candidates must demonstrate a capacity for independent research by preparing an original thesis on a topic

within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

Research Centers. Two interdisciplinary research centers administered by the Department of Civil Engineering are the Advanced Construction Technology Center, which concentrates on studies of construction material, nondestructive evaluation, computer-aided construction, and special technologies; and the Center for Cement Composite Materials, which is devoted to developing new cement-based, high-strength materials. Other continuing efforts include the Fracture Control Program and the Materials Processing Consortium.

Financial Aid. Financial aid is available in the form of fellowships, research and teaching assistantships, and tuition and partial fee waivers.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Chair of the Department: J.J. Bateman
Correspondence and Information: Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.J. Bateman, G.M. Browne, W.M. Calder III, H.H. Hock, H. Jacobson, J.K. Newman, D. Sansone, W.R. Schoedel, L. Zgusta
Associate Professors: J.A. Dengate, E.R. Hostetter
Assistant Professors: S.D. Olson, M.G. Parca
Emeritus Professor: M. Marcovich

Graduate Degree Programs. The Department of the Classics offers graduate work leading to the Master of Arts in Classics, Greek, Latin, and the Doctor of Philosophy in Classical Philology. Although the graduate program is designed to provide a thorough education in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including papyrology, Byzantine and Renaissance authors); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, ancient philosophy, and classical linguistics. A statement of "Regulations for Advanced Degrees in the Classics" and special programs for prospective secondary school teachers may be obtained from the departmental office.

Admission. In addition to meeting the admission requirements of the Graduate College, applicants for admission to graduate study in the classics curriculum must ordinarily present at least 20 hours in either Greek or Latin and 15 hours in the other language; candidates for admission to the Greek or Latin curriculum must ordinarily present at least 20 hours in that language. Previous work in ancient history, ancient art and archaeology, philosophy, literary criticism, or linguistics is desirable.

Master of Arts. The master of arts may be taken in Classics, Greek or Latin. Candidates for this degree must complete 8 units of course work. For the AM in Classics: 6 units of Greek and Latin, with at least 2 units in each language and at least 3 units at the 400 level (excluding 400-401); 2 units of electives; and sight-translation examinations in both languages. For the AM in Greek (Latin): 5 units in Greek (Latin) with at least 3 units at the 400 level; 3 units of electives; and sight-translation examination in Greek (Latin). With the consent of the student's adviser, up to 2 units of thesis research may be counted toward elective credit for the AM in Classics, Greek, or Latin.

Doctor of Philosophy. The doctor of philosophy is offered only in classical philology, which requires advanced work in both Greek and Latin. Candidates for the PhD program are eligible for acceptance upon completion of the master's degree in classics or its equivalent. Once admitted, they must complete at least 16 additional units of course work. These include 6 units

in Greek and Latin, with at least 2 units in each language and at least 5 at the 400 level, 2 units of appropriate electives, and up to 8 units of thesis research. The department requires a reading knowledge of two ancillary languages, German and (usually) French. Knowledge of one of these must be demonstrated at the time of admission to Stage II and the other before the start of the second year at Stage II. Admission to the thesis level requires passing examinations in Greek and Latin sight-translation, the history of Greek and Latin literature, and a special author, as well as the preliminary oral examination.

Research Interests. Two periodicals are edited in the department: *Illinois Classical Studies* and *Journal of Coptic Studies.*

Resources. The separate Classics Library has about 45,000 titles. The University of Illinois Library's Rare Book Room houses the Turyn Archive of Greek manuscript photographs and the American Center of the International Photographic Archive of Papyri. The Krannert Art Museum and the World Heritage Museum have outstanding collections of ancient vases and other artifacts. The department has an Ibycus Scholarly Computer with a TLG CD-ROM disk.

Financial Aid. Teaching assistantships and University fellowships are available for the academic year and summer session.

COGNITIVE SCIENCE/ARTIFICIAL INTELLIGENCE

Cognitive Science is the study of intelligent systems--both natural and artificial--combining knowledge primarily from computer science, linguistics, and psychology. The field also has strong links to the neurosciences, philosophy, and anthropology, as well as to the physical and engineering sciences dealing with complex dynamical systems.

Although there is no single academic department or formal degree labelled *Cognitive Science,* graduate students can pursue studies in cognitive science through existing departmental programs and through participation in research projects at the University's Beckman Institute for Advanced Science and Technology. The most common departmental affiliations of students interested in cognitive science are computer science, linguistics, psychology, and educational psychology. Normally, in their first year of graduate study, interested students will take the proseminar in cognitive science in addition to working on specific departmental requirements. In their second year and beyond, students will begin to specialize in an area within cognitive science: learning and conceptual organization, computational linguistics, and psycholinguistics. Each of these subareas is represented by a number of faculty and is associated with many available graduate courses.

For further information contact Cognitive Science / Artificial Intelligence Steering Committee, Room 2127 Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 405 North Mathews Avenue, Urbana, IL 61801; (217) 244-1983.

COMMUNICATIONS

Dean of the College of Communications: James W. Carey
Chair of the Graduate Committee: Clifford G. Christians
Correspondence and Information: Chair, Graduate Committee in Communications, University of Illinois at Urbana-Champaign, 222b Armory, 505 East Armory Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: W.F. Brewer, J.W. Carey, C. Christians, J.G. Delia, N. Denzin, M.E. Fishbein, T. Guback, H. Maclay, R. Merritt, K.B. Rotzoll, E.A. Wartella
Associate Professors: L.G. Grossberg, P. Treichler, D.C. Whitney
Assistant Professors: S. Braman, J. Nerone
Emeritus Professors: J.W. Jensen, C.E. Osgood, T. Peterson

Graduate Degree Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences supported by the humanities, fine and applied arts, and natural sciences to the basic problems of human communications. It is intended for students who plan careers in teaching such communications subjects as journalism, radio-television, and media studies; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Doctor of Philosophy. The PhD program requires a minimum of 24 units beyond the bachelor's degree. Students working toward a PhD degree usually require from three to five years to complete their work. Full-time students entering the program directly after receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a thesis. Full-time students entering with a master's degree should expect to take a minimum of one year of course work before embarking on the thesis. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the thesis. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism or Advertising or in one of the departments in the social sciences.

COMMUNITY HEALTH

Head of the Department: R. Warwick Armstrong
Correspondence and Information: Director of Graduate Studies, Department of Community Health, University of Illinois at Urbana-Champaign, 114 Huff Hall, 1206 South Fourth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.W. Armstrong, P.B. Imrey, R.G. Mortimer, L.B. O'Reilly, T.W. O'Rourke, R.F. Rich, D.B. Stone
Associate Professors: R.J. Buchanan, L. Rubinson
Assistant Professors: J.S. Reis, K.A. Rosenblatt

Graduate Degree Programs. The Department of Community Health offers programs of study leading to the master of science, Master of Science in Public Health, and doctor of philosophy degrees. At the master's degree level, the program offers options in epidemiology, health behavior, health policy and administration, and community health education. The MSPH degree in community health education has been accredited by the Council on Education for Public Health. The PhD program is designed to prepare graduates for positions of leadership in teaching, research, and service in universities, industries, and private and government agencies in the United States and in other countries. Opportunities are available for graduate students who desire to concentrate in other public health areas through an intercampus program with the School of Public Health at the University of Illinois at Chicago.

Admission. The Graduate College admission requirements apply for all applicants. Candidates wishing admission to the MS program will have their grade-point averages computed for their last 60 semester hours of undergraduate courses (excluding student teaching, fieldwork, or activity courses). In addition, satisfactory scores on the verbal and quantitative sections of the Graduate Record Examination are required.

The admission requirements for the PhD program include the following: an acceptable

grade-point average in the last 60 hours of undergraduate course work (not including student teaching, fieldwork, or activity courses), an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test, and satisfactory scores on the verbal, quantitative, and analytical sections of the Graduate Record Examination. Candidates are required to have a personal interview with the director of graduate studies or other representatives of the department. Preference is given to students who have had at least two years of professional experience. Applicants whose native language is not English must score at least 590 on the TOEFL examination.

Master of Science. The specializations in epidemiology and health behavior require a minimum of 8 units of graduate credit. Three units must be at the 400 level, with 2 of these units in community health courses. The program includes completion of 3 units of core courses, which are intended to provide overall knowledge of the public health field and the tools necessary for successful functioning as a health specialist. A thesis (1 to 2 units) is required. Students entering the program will be expected to have completed undergraduate course work in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the master of science degree.

The specialization in health policy and administration generally takes two years, depending upon prior education and experience. A minimum of 12 units of graduate credit is required; 6 units must be at the 400 level, with 3 of these units in community health courses. The program includes 8 units of required courses, which are intended to provide an overall knowledge of the public health field and the tools necessary for successful functioning as a health policy and administration specialist, and a thesis or research project (1 unit). Students entering the program are expected to have completed undergraduate course work in economics, social sciences, and data collection and processing, which includes issues of measurement, questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the degree.

Master of Science in Public Health. The program for the MSPH degree, which is in community health education, is accredited by the Council on Education for Public Health. The program generally takes two years, depending upon prior education and experience. A minimum of 12 units of graduate credit is required. Three units must be at the 400 level, with 2 of these units in community health courses. The program includes $6^{1}/_{2}$ units of required courses that are intended to provide an overall knowledge of the public health field and the tools necessary for successful functioning as a community health education specialist; 1 unit of fieldwork experience in the summer; and a thesis (1 to 2 units). Students entering the program are expected to have completed undergraduate course work in data collection and processing, including issues of measurement and questionnaire design, computerization, descriptive health measures, and statistical analysis through regression. Courses must have been completed with grades of B or better. Deficiencies in these areas will require additional course work, as necessary, for successful completion of the degree.

Doctor of Philosophy. A master's degree with a thesis or equivalent is required for applicants to the PhD program. Graduate course experience in public health and statistics with grades of B or better is expected prior to admission. Before admission to the PhD program, students may be required to take up to 3 units of additional course work to remedy deficiencies. Candidates for the degree must complete a minimum of 16 units of credit beyond the master's degree, including the following: two community health 400-level courses in the area of specialization; one community health 490 research seminar; one 400-level course in advanced quantitative methods; one minor for a minimum of 4 units, or two minors for a minimum of 2 units each (in both cases outside the major field); and completion of an acceptable dissertation (8 units). In addition, candidates must demonstrate the ability to speak and read two foreign languages, complete 4 units of research skill courses, or demonstrate the ability to speak and read one foreign language and complete 2 units of research skill courses. The candidate is required to pass

written preliminary examinations covering community health, application of social science, epidemiology, research and quantitative methods, the major area of specialization, and the minor field; to pass an oral preliminary examination on the area of specialization and dissertation proposal; and to pass an oral defense of dissertation research.

Faculty Research Interests. Faculty research interests cover a wide range including, but not limited to, health education, community health development, health behavior, health policy, health planning and management, epidemiology, biostatistical and epidemiologic research methodology, and evaluation research.

Medical Scholars Program. This program allows the student interested in medicine and community health to earn both the MD and PhD (community health) degrees while gaining multidisciplinary research experience. Individually tailored programs can be developed within the requirements of both programs. Degree work will be arranged to accommodate the schedules of both programs. However, the course of study in community health will be equivalent to that of all other doctoral candidates. Write to the Program Director of the Medical Scholars Program, College of Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801, for further information regarding the program.

Financial Aid. Financial aid is available on a competitive basis to qualified students in the form of teaching and research assistantships and tuition and service fee waivers.

COMPARATIVE LITERATURE

Director of the Program: Michael Palencia-Roth
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: N. Blake, W. Hollerer, H. Knust, J. Marchand, M. Palencia-Roth, G. Tikku
Associate Professor: J. Smarr
Assistant Professor: D. Pan
Emeritus Professors: A.O. Aldridge

Graduate Degree Programs. The program in comparative literature offers graduate work leading to the degrees of master of arts and doctor of philosophy and is designed to provide a systematic study of subjects and problems common to several literatures. Its purpose is to enable students who have varied linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and the relations between literature and the other arts.

Admission. In addition to meeting the Graduate College admission requirements, a student entering the program should have an undergraduate major in English, the classics, or a foreign language. Majors in history and philosophy may be accepted with the special consent of the director of the program. For applicants to the PhD curriculum, the AM will function as the qualifying test. Students entering with a recognized AM degree from another university or from another department of this University will take the comparative literature component and a literary component of this program's regular master of arts examination at the end of the first year as a qualifying test.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or Neoclassicism. Competence in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the program in comparative literature

with the assistance of an expert in the language concerned. This choice is intended to provide for languages that may not be taught in regular departments.

The candidate must complete 8 units of credit, including two courses in the theory of literature (Comparative Literature 401 and 402) and two seminars in comparative literature selected from Comparative Literature 451, 461, 471, and 481; the other 4 units should be taken in two or three national literatures in a distribution approved by the adviser; at least 5 of 8 units must be in courses at the 400 level. The candidate must pass a written examination based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text.

Doctor of Philosophy. A candidate for the doctor of philosophy degree must fulfill the general requirements of the Graduate College in addition to those specified above for the master's degree. Competence must be demonstrated in at least three foreign languages as well as in English. These three languages will coincide with those vital to the student's thesis and area of specialization. At least 5 units will consist of comparative literature seminars. Three additional units of work at the 400 level should be taken in courses regularly offered by the literature departments; among these, courses crosslisted with the program in comparative literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student also selects a period of major interest and is responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be the Middle Ages, Renaissance, Neoclassicism, and the Enlightenment, or the modern (nineteenth and twentieth centuries). Some chronological variations in coordinating the minors will be allowed for students studying non-Western literatures. A preliminary examination, a four-part written examination based on the individual program, and an oral examination with emphasis on the thesis project must be passed. The candidate must present an acceptable thesis embracing several national literatures and pass a final oral examination on the thesis.

Financial Aid. A limited number of University fellowships, tuition and service fee waivers, and teaching assistantships, in cooperation with other departments, is available.

COMPUTER SCIENCE

Head of the Department: D.H. Lawrie

Correspondence and Information: Academic Office, 2413 Digital Computer Laboratory, Department of Computer Science, University of Illinois at Urbana-Champaign, 1304 West Springfield Avenue, Urbana, IL 61801. Electronic mail: academic@cs.uiuc.edu; phone number: (217) 333-3527.

GRADUATE FACULTY

Professors: G.G. Belford, R.H. Campbell, G. Cybenko, N. Dershowitz, H. Edelsbrunner, M. Faiman, M. Heath, W.J. Kubitz, D. Kuck, D.H. Lawrie, A. Levy, C.L. Liu, J.W-S. Liu, D. Muller, S. Muroga, S.R. Ray, D. Reed, E.M. Reingold, P.E. Saylor, R.D. Skeel

Associate Professors: G. Dejong, H.G. Friedman, Jr., M.T. Harandi, L.V. Kale, S.N. Kamin, S. Kaplan, T. Kerkhoven, K.-J. Lin, M.D. Mickunas, D. Padua, U. Reddy, L.A. Rendell, P. Yew

Assistant Professors: G. Agha, R. Eigenmann, P. Emrath, A.M. Frisch, K.A. Gallivan, E. Gallopoulos, E. Golin, W. Harrison, W.J. Harrod, C. Hayes, R. Johnson, L.G. Jones, D.W. Knapp, P. Ng, L. Pitt, J. Ponoe, F. Saied, P. Vaidya, A.V. Veidenbaum, D.C. Wilkins, M.S. Winslett

Adjunct Faculty: A. Baskin, M. Condry, D.D Hearn

Emeritus Professors: C.W.Gear, G. Metze, W.J. Poppelbaum, J.E. Robertson

Graduate Degree Programs. The Department of Computer Science offers graduate programs leading to the degrees of PhD, MS, MCS (a nonthesis option), and MSTCS (for teachers). The MS requires 8 units of course work, including a l-unit thesis (1 unit equals 4 semester hours). The PhD requires 16 units of course work, which usually includes an MS, and a thesis describing original research. The MCS, a terminal degree, requires 9 units of course work. The MSTCS requires 8

units of course work and approved teaching experience. There are also programs that enable students to combine an MCS with an MArch or an MBA. For an application and departmental materials that provide greater detail on programs, offerings, admission, degree requirements, and financial aid, contact the department at the above addresses or telephone number.

Admission. Those seeking admission to any of the department's graduate programs should write, telephone, or send e-mail for an application package. Applicants should state whether they are U.S. citizens, permanent residents, or international students. All materials, credentials, and test scores must be received by the following deadlines: for summer or fall terms—January 15; for spring terms—September 1. Applicants must hold or be about to receive a bachelor's degree equivalent to that granted by the University of Illinois at Urbana-Champaign. Their grade-point average (GPA) for the last 60 semester hours of undergraduate study must correspond to a B or higher. If they also hold a master's degree, the GPA for that must also be at least a B. In addition to a completed application form, applicants must send the designated fee payable to the University, official copies of transcripts of all completed university course work, and three letters of reference. All applicants must also submit their scores on the Graduate Record Examination (GRE) general aptitude tests: verbal, quantitative, and analytical portions. A score for the Computer Science Subject Test is not required, but if included will be considered in evaluating the application. International applicants whose native language is not English and who have attended a university in an English-speaking country for less than two years must submit a score of at least 570 for the Test of English as a Foreign Language (TOFEL). In addition, all applicants, regardless of U.S. citizenship, whose native language is not English and who wish to be considered for financial aid must submit a score of 230 or more for the Test of Spoken English (TSE). State law requires this only for teaching assistants, but the department requires it also for all other forms of financial aid. The recommended background for entering students is a bachelor's or master's degree in computer science or computer engineering. Students with degrees from other disciplines who have had mathematics through calculus and linear algebra are also admitted, but may not be qualified initially to be awarded assistantships in computer science. The GPAs of applicants admitted for the past few years have averaged 4.6 (A = 5.0); the total GRE (general) scores averaged 2,000 (2,400 maximum).

DANCE

Head of the Department: Patricia K. Knowles
Correspondence and Information: Graduate Program, Department of Dance, University of Illinois at Urbana-Champaign, 4-501 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professor: P.K. Knowles
Associate Professor: R. Wadleigh
Assistant Professors: R. Nettl-Fiol, J.O. Perpener III

(The resident faculty is augmented by visiting professional artists who teach advanced studio courses. The equivalent of one full-time faculty position is reserved for the Artist-in-Residence Program.)

Admission. Prerequisites for admission are (1) an undergraduate degree in dance comparable to that granted by the University of Illinois at Urbana-Champaign or equivalent experience (students who are deficient in undergraduate course work may be admitted, but will be expected to make up any deficiencies) and (2) demonstrated advanced technical skill and choreographic ability (candidates must pass a qualifying audition to confirm advanced technical proficiency and to demonstrate facility in choreography).

Graduate Degree Program. The MFA Program in Dance is a practice-oriented terminal degree program for students in performance and choreography. Degree requirements are 15 units and a minimum two-year (4-semester) residence. Course work taken to complete undergraduate

deficiencies may increase the residence requirements to 5 or 6 semesters. A culminating creative project (Dance 498, 2 units) must be approved and accepted by the graduate faculty. In the areas of technique, choreography, performance, production, independent research, theory, seminar, and the culminating project, 12 units are required. The remaining 3 units of electives may be taken in dance or in related areas of interest. The ability of the candidates to pursue graduate study will be assessed regularly, and they will be advised accordingly.

Financial Aid. Four forms of financial aid are offered by the Department of Dance: resident and nonresident tuition scholarships; graduate teaching assistantships that include tuition waivers; fellowships in the amount of $6,000 for students from underrepresented populations (Black, Hispanic, Native American); and the Creative and Performing Arts Fellowship that includes a $4,000 stipend and a tuition waiver. This Graduate College fellowship is awarded to a graduate student who demonstrates outstanding choreographic and performance talent.

ECONOMICS

Head of the Department: Daniel Orr
Director of Graduate Studies: Nicholas Yannelis
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: L. Alston, R. Arnould, J. Atack. W. Baer, F. Blau, J. Brueckner, D. Coes, M. Ferber, J. Giertz, R. Gillespie, F. Gottheil, E. Grinols, P. Hartman, W. Hendricks, C. Kahn, L. Kahn, R. Koenker, J. Leuthold, W. McMahon, L. Neal, P. Newbold, D. Orr, S. Rashid, R. Resek, P. Schran, F. Shupp, P. Spiller, C. Sprenkle, K. Taira, T. Ulen, P. Wells, N. Yannelis
Associate Professors: L. Arvan, A. Bera, L. DeBrock, H. Esfahani, R. Husby, C. Kolstad, H. Williamson
Assistant Professors: B. Chakravorti, J. Conley, M. Feldman, P. Graziano, S. Greenstein, M. Huggett, S. Krasa, C. Kuan, W. Maloney, A. Villamil

Graduate Degree Programs. The Department of Economics offers graduate work leading to the Master of Science in Policy Economics and doctor of philosophy degrees. The candidate for an advanced degree may specialize in the following fields: microeconomic theory, environment and natural resources, history of economic thought, public finance, monetary theory, international economics, economic history, labor economics, growth and development, comparative economic systems, urban and regional economics, mathematical economics, econometrics, industrial organization, law and economics, and human resource economics.

Master of Science in Policy Economics. This is a specially designed, intensive, one-year program of study. It is intended for promising young administrators in government and private institutions (in both Third World countries and advanced industrial countries) who need additional training in the areas of economic analysis and quantitative techniques. Individuals with other backgrounds and interests may substitute appropriate advanced-level courses for the core courses listed below.

The program of study in policy economics consists of 10 units of graduate course work. A core of four courses (macroeconomics, microeconomics, statistics, and applied econometrics) is required of all students in the program. Beyond that core, students select one field of concentration from those listed above. An additional four graduate credit courses are to be completed. Two of these must be taken in economics, and an additional two courses may be in economics or in other areas. Students may enter the program in the fall term.

This required course work is further enriched through (1) a short course in computers, which is later used in the statistics and econometrics courses; (2) opportunity to go on field trips to observe financial institutions, commodity exchanges, and the like; (3) scheduled lectures by outstanding, internationally known economists (two Nobel Prize laureates in economics have presented special seminars); (4) discussion groups and tutoring for participants who are having difficulty; (5) program staff to help with visas, housing, and other problems.

Tuition and fees for this program are substantially higher than those in other University programs. No financial aid is available for students in this program.

Doctor of Philosophy. The PhD program requires the completion of 24 units of study beyond the bachelor's degree. Specific requirements include 1 unit in mathematics for economists, 3 units of microtheory, 2 units of macrotheory, 3 units of statistics and econometrics, and 8 doctoral thesis units. Candidates must maintain a grade-point average of B+ in the micro, macro, and statistics work. Candidates must also successfully complete two fields through course work and/or a written examination. A research paper is also required. In addition, candidates are required to give an oral defense of the thesis proposal and pass an oral final examination covering the research. A student with an appropriate background in economics and mathematics who devotes full time to graduate work can complete the PhD degree in three years beyond the bachelor's degree. An additional year or more is sometimes necessary, especially for those holding part-time assistantships.

In addition to the standard undergraduate preparation in economics, students are expected to have had at least two semesters of calculus and one of linear algebra to be admitted to the PhD program. The results of the Graduate Record Examination should accompany applications for admission. The Graduate College admission requirements apply. In addition, international students must submit TOEFL results; if they wish to apply for full financial aid, the Test of Spoken English (TSE) is also required.

Master's Program in Economics. A master of arts degree and a master of science degree are available for students in the PhD program to enable them to earn a master's as they work toward the PhD degree. Students interested in a terminal master's degree are not admitted to the PhD program.

Financial Aid. Over the past seven years, the Department of Economics has been able to offer fellowships or half-time assistantships to all domestic students who meet the standards for entrance or continuation in the PhD program. A similar commitment to domestic students is anticipated for the coming year. Teaching assistantships are generally not given to international students during their first year unless they have scored at least 230 on the TSE.

EDUCATION

(Including Administration, Higher, and Continuing Education; Curriculum and Instruction; Educational Policy Studies; Educational Psychology; Special Education; and Vocational and Technical Education)

Dean of the College of Education: P. David Pearson
Correspondence and Information: Fred S. Coombs, Associate Dean for Graduate Programs, College of Education, University of Illinois at Urbana-Champaign, 120 Education Building, 1310 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: C.A. Ames, R.E. Ames, J.D. Anderson, R.C. Anderson, S.R. Asher, E. Boardman, P.G. Braunfeld, B.C. Bruce, F.S. Coombs, D. Durkin, R.H. Ennis, H.S. Farmer, W. Feinberg, R. Felner, M.B. Griggs, L.W. Harmon, L.W. Heal, R.A. Henderson, J. Hill, K.T. Hill, S.O. Ikenberry, B.B. Kachru, C.J. Karier, L.G. Katz, H.C. Kazanas, G.W. Ladd, J.W. Loeb, H.S. Maclay, T. Manolakes, J.A. Mason, J.A. McCollum, G. McConkie, T.L. McGreal, W.W. McMahon, P.D. Pearson, A. Peshkin, F.A. Rodgers, B.V. Rosenshine, L.J. Rubin, F. Rusch, S.J. Savignon, R.A. Smith, R.J. Spiro, B. Spodek, R.L. Sprague, R.E. Stake, K.J. Travers, P.C. Violas, J.L. Walker, T.L. Wentling, C.K. West, I. Westbury, J.S. Zaccaria
Associate Professors: T.H. Anderson, B. Armbruster, A. Baroody, S. Benson, L. F. Bouton, P. Bowman, N. Burbules, R. Clift, E. J. Copeland, G.A. Cziko, J.R. Dennis, D.L. Essex-Sorlie, J. Farmer, L.F. Fitzgerald, J.A. Fley, S.A. Fowler, J.W. Halle, D.L. Harnisch, K.R. Koenke, J. Leach, J.A. Levin, M.V. Levine, A.L. Madsen, E.F. McClure, R.E. Nelson, J.C. Ory, R.C. Page, L.M. Perkins, A.M. Renzaglia, J.B. Rounds, C. Schiro-Geist, D. Scott-Jones, M.M. Shorish, J.

Tanaka, E.R. Terwilliger, P.W. Thurston, S.E. Tozer, T. Tracey, W.T. Trent, J.G. Ward, J.L. Wardrop, M.L. Waugh, C.M. Weller, K.G. Witz.

Assistant Professors: T. Ackerman, K. Alston, D. Bragg, L. Bresler, D. Brown, J. Chadsey-Rusch, K.A. Copeland, L. DeStefano, J.L. Ellickson, J. Gaffney, G.E. Garcia, P.L. Glidden, V.J. Harris, S.D. Johnson, J.S. Kemp, C.E. Kozoll, I. Langston, B. Merchant, L. Meyer, L. Monda-Amaya, M.M. Ostrosky, N. Prestine, P.S. Riegel, F. Sloane, E.R. Steinberg, D. Walsh, A. Willis, R.F. Wilson, P.P. Zodhiates, D. Zola

Emeritus Professors: C. Allen, E.F. Anderson, H.S. Broudy, C.B. Cox, T. Denny, J.A. Easley, R.N. Evans, E.L. Evertts, O. Gould, J.T. Hastings, P.E. Hemp, D.D. Henry, G.A. Hoke, L.G. Humphreys, W.D. Johnson, L.J. Jordan, H.J. Kaczkowski, M.B. Karnes, H.H. Lerch, C.J. McIntyre, W. McLure, F.M. McMurray, W.J. Moore, C.H. Patterson, M.J. Phillips, L.J. Phipps, P. Quigley, F.M. Raubinger, H. Shores, R.H. Simpson, J.M. Slater, L.R. Tucker

Graduate Degree Programs. The College of Education offers graduate work leading to the Master of Education, the master of arts, the master of science, the advanced certificate, the Doctor of Education, and the doctor of philosophy degrees.

Graduate students in the College of Education may enroll in one of the six departments listed above. The following suggests the broad range of specialties available within the college: agricultural education; aesthetic education; business, office, and distributive education; comparative education; continuing and adult education; computer applications in education; counseling psychology; early childhood education; educational administration and supervision; educational psychology; elementary school subject specialties (mathematics, language arts, science, social sciences); statistics and measurement; higher education; history of education; educational policy analysis; home economics education; human development; industrial education; language development; learning and instruction; philosophy of education; quantitative and evaluative research methodologies; reading; secondary education (English, mathematics, science, social science); sociocultural perspectives; special education; (a) special learning and behavior problems, severe behavioral handicaps, early childhood education, vocational education for students with special needs, skills improvement and (b) program administration; and teacher education (elementary, secondary, vocational, special). Other areas of specialization within education may be developed by the student and adviser. More detailed descriptions of specializations offered within departments are available through departmental offices.

Certification.
State certification as a teacher or administrator is required for advanced graduate study in some fields. The Council on Teacher Education functions as the all-University governance system for certification. Graduate students who wish to qualify for the council's recommendation for a teaching certificate must complete the appropriate undergraduate or graduate program or its equivalent. Individual exceptions must be sought via petition to the council. Students are invited to contact the executive director of the Council on Teacher Education to ascertain the approval status of each program with the Illinois State Board of Education.

Master of Education.
Admission. Students may be considered for admission if they are (1) graduates of an institution awarding a baccalaureate or equivalent degree comparable to that of the University of Illinois at Urbana-Champaign; (2) adequately prepared for advanced study as demonstrated by previous experience, personal qualifications, and scholastic records; and (3) recommended by the proposed department of study. The Graduate College admission requirements apply. Some departments in the College of Education require additional test scores of applicants.

Program Description. Within each of the departments in the College of Education exists a rich variety of practice-centered programs adaptable to the interests of beginning graduate students. The Master of Education is a professional degree designed for those students who seek a practical understanding to prepare them for work in the educational professions.

Requirements. A minimum of 8 units of study is required to meet degree requirements except in educational administration, which has a 10-unit requirement. Students are required to take two courses in educational psychology and two courses in educational policy studies. In educational psychology, one course is selected from the psychological foundations of learning area (Educa-

tional Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In educational policy studies, one course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, or 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, 307, or 308). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required, and the program is completed by additional 300- or 400-level courses selected by students in consultation with an academic adviser. Individual departments in the college may require a student to take additional courses beyond these to complete the program. The credit-no credit option may not be used to meet the minimum 8-unit requirement for this degree. No thesis is required for the EdM degree.

Master of Arts and Master of Science.
Admission requirements are the same as those for the Master of Education degree.

Program Description. An extensive offering of research-based programs may be found in the college. All the specialties listed earlier may be pursued from a research perspective. The AM and MS are research-oriented degrees designed for students who seek research careers in education-related fields.

Requirements. A minimum of 8 units of study is required to meet degree requirements, except in educational administration and counseling psychology, which require 10 units. Students must take two courses in educational psychology and two courses in educational policy studies. In educational psychology, one course is selected from the psychological foundations of learning area (Educational Psychology 311, 313, or 314), and one course is selected from the psychological foundations of personality and development area (Educational Psychology 312, 315, or 316). In educational policy studies, one course is selected from the social foundations area (Educational Policy Studies 300, 302, 303, 309, 310, or 315) and a second course is selected from the philosophical foundations area (Educational Policy Studies 301, 304, 305, 306, 307, or 308). Students may take proficiency examinations in any of these required courses. Three units of 400-level courses in education are required. Individual departments may require students to take additional courses to complete a program. The credit-no credit option may not be used to meet the minimum 8-unit requirement for this degree. No more than 2 units of thesis credit count toward the minimum 8 units. Each student must defend the required thesis in an oral examination before a committee of three faculty members chaired by the student's adviser.

Advanced Certificate in Education.
Admission. A master's degree in an appropriate field and two years of successful professional education experience are required for admission to the advanced certificate program. Some advanced certificate programs require students to submit Miller Analogies Test scores for admission.

Program Description. The advanced certificate may be pursued in administration, higher, and continuing education; curriculum and instruction; educational psychology; special education; and vocational and technical education. The advanced certificate program is intended for students who desire a planned course of study beyond the master's degree, but do not wish to pursue the type of scholarly work typically expected in a doctoral program.

Requirements. A minimum of 8 units beyond the master's degree is required for the degree; 4 units must be at the 400 level. A student who has not previously taken the foundations courses in educational psychology and educational policy studies required for the EdM, AM, or MS degree must do so or pass proficiency examinations for these courses. The credit-no credit option may not be used to satisfy the minimum requirements for this degree.

Doctor of Education.
Admission. Applicants for study leading to doctoral degrees must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require

either the Miller Analogies Test or the Graduate Record Examination, as well as other tests. Applicants should contact departments concerning requirements for submission of test scores and other information. The applicant must hold a master's degree with a major in education or another related subject from an institution whose degrees are comparable to those of the University of Illinois at Urbana-Champaign. The general admission requirements of the Graduate College must be met.

Program Description. Students may study any of the broad range of specialties listed on page 81. Programs leading to the Doctor of Education degree are designed to provide advanced professional training and to develop further ability in the scholarly study of professional practice-centered problems.

Requirements. The degree requires 16 units of credit, including up to 4 units of thesis credit, beyond the master's degree. A student who has completed course work taken as part of the requirements for the Advanced Certificate in Education at the University of Illinois at Urbana-Champaign may petition for the application of not more than 6 units of such work toward the program leading to the Doctor of Education, provided that the course work has been taken within five years of the date of petition. Within the required 16 units, a student must complete two perspective course options of 2 units each, designed to help in understanding and interpreting the developing practitioner-scholar role. Options are chosen from an approved list of courses in several areas. Between admission and completion of degree requirements, an EdD student must complete a supervised fieldwork experience for which 1 unit to 4 units of credit may be awarded.

Minimum residence requirements may be met by on-campus registration for either two consecutive semesters with at least 3 units of course work in each, or one semester with at least 3 units plus at least $1\frac{1}{2}$ units in the summer session immediately preceding or following.

Near the end of course work and before admission to the oral preliminary examination, the applicant must take written (qualifying) examinations in the area of specialization and in research methodology. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by three readers. All parts of the examination must display competent doctoral work to all readers.

An EdD candidate must complete a thesis in accordance with the general requirements of the Graduate College; no more than 4 units of thesis credit may be used to meet the 16-unit requirement.

Doctor of Philosophy.

Admission. The applicant must hold a master's degree with a major in education or another related subject from an institution whose degrees are comparable to those of the University of Illinois at Urbana-Champaign. The Graduate College admission requirements apply. Applicants must submit a complete application for admission, including three letters of reference and official transcripts of all previous undergraduate and graduate work. In addition, some departments within the college require either the Miller Analogies Test or the Graduate Record Examination, as well as other tests. Applicants should contact departments concerning requirements for submission of test scores and other information.

Program Description. Students may study any of the specialties listed on page 81. The PhD program is planned by each student with an adviser to develop the student's ability to do scholarly research in a specialized field of education.

Requirements. The PhD degree requires 16 units of credit beyond the master's degree, including up to 8 units of thesis credit. Each candidate must fulfill an educational research study early in that program under the guidance of a research committee. Each PhD candidate in the College of Education completes, as a part of the graduate program, an approved supervised professional work experience that is at least the equivalent of half-time work for one semester. This requirement must be completed between admission and the completion of degree requirements. Acceptance of credit earned elsewhere does not reduce the Graduate College resident credit requirement. The College of Education requires a residence period beyond the master's, which

must include two successive semesters on the Urbana-Champaign campus, during each of which the student takes a minimum of 3 units.

A student is required to demonstrate competence in one of several research methodology areas. This requirement is in addition to the minimum of 16 units of credit beyond the master's degree. Requirements in the research methodology area are available from the Instructional Programs Office, College of Education.

Near the end of course work and before admission to the oral preliminary examination, a PhD candidate must complete written (qualifying) examinations in the area of specialization. Examinations include a general field exam and a special field exam. Additional written or oral examinations may be required by some departments or areas of specialization. Each portion of the examination is read and evaluated separately by at least three readers. All parts of the examination must display competent doctoral work to all readers.

A PhD candidate must complete a thesis in accordance with the general requirements of the Graduate College; no more than 8 units of thesis credit may be applied to the 16-unit requirement.

Financial Aid. All major doctoral programs have teaching and research assistantships available. Some fellowships and tuition and service fee waivers are also available. In the past a majority of doctoral students have received some form of financial aid during their period of study. Additional information concerning financial aid can be obtained from the six departmental offices listed on page 80.

ELECTRICAL AND COMPUTER ENGINEERING

Head of the Department: T.N. Trick

Correspondence and Information: Graduate Programs, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 155 Everitt Laboratory, 1406 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: N. Ahuja, M.T. Basar, S. Bishop, W.C. Chew, J.J. Coleman, G. Cybenko, T.A. DeTemple, F. Dunn, J.G. Eden, M. Feng, L.A. Frizzell, O.L. Gaddy, C.S. Gardner, B. Hajek, I.N. Hajj, K. Hess, N. Holonyak, Jr., T.S. Huang, B.J. Hunsinger, R. Iyer, W.K. Jenkins, S.M. Kang, K. Kim, P.W. Klock, P.R. Kumar, M.J. Kushner, J.P. Leburton, S.W. Lee, C.H. Liu, M.C. Loui, R.L. Magin, P.E. Mayes, G.A. Metze, R. Mittra, D.C. Munson, Jr., W.D. O'Brien, Jr., M.A. Pai, J.H. Patel, W.R. Perkins, M.B. Pursley, P.L. Ransom, N.N. Rao, D.V. Sarwate, P.W. Sauer, C.F. Sechrist, Jr., L.G. Smith, G.E. Stillman, T.N. Trick, J.R. Tucker, R.J. Turnbull, P. Van Dooren, J.T. Verdeyen, B.W. Wah, K.C. Yeh

Associate Professors: I. Adesida, P. Banerjee, J.W. Beauchamp, D.J. Brown, K.Y. Cheng, S.L. Chuang, S.J. Franke, W.K. Fuchs, E. Kudeki, J.W. Lyding, E.A. Mechtly, H. Merkelo, H. Morkoc, B. Oakley II, U. Ravaioli, B.S. Song, B.C. Wheeler, P.C. Yew

Assistant Professors: K.S. Arun, B. Bamieh, A.R. Barron, D.J. Brady, Y. Bresler, K.C. Hsieh, S.E. Hutchinson, W.M. Hwu, D.L. Jones, P.T. Krein, S. Meyn, G. Papen, C. Polychronopoulos, M.T. Orchard, T. Overbye, D.G. Saab, R. Saleh, J.E. Schutt-Aine

Graduate Degree Programs. The department offers graduate study and research in electrical and computer engineering leading to the degrees of master of science and doctor of philosophy. Courses and research opportunities are offered in four general areas: *computer engineering and computational science,* which includes computer architecture, VLSI design and CAD tools, hardware, software and applications, fault tolerance, testing, performance evaluation, computer vision, robotics, and algorithms and complexity; *fields and waves,* which includes electromagnetics, antennas, millimeter wave-integrated circuits, radar scattering, propagation, atmospheric and ionospheric studies, and remote sensing; *physical and quantum electronics,* which includes solid-state theory and devices, compound-semiconductor epitaxial growth techniques, microwave and high-speed devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles; and *systems,* which includes integrated circuits, computer-aided

design, signal and image processing, communication systems, coding and information theory, communication networks, control systems, optimization, power and energy systems, and power electronics. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, biomedical instrumentation, ultrasonics, electronic music, radiation oncology, and nutritional sciences.

Admission. Applicants must have completed an electrical engineering curriculum or a computer engineering curriculum substantially equivalent to those of the University of Illinois at Urbana-Champaign. A minimum GPA of 4.0 (A = 5.0) on the last sixty hours is required. However, because of space limitations, applicants with GPAs below 4.5 are rarely admitted. All applicants must submit scores from the general test of the Graduate Record Examination. Applicants with master's degrees are admitted only if a faculty member is willing to serve as the PhD thesis adviser. Accordingly, such applicants should write or call prospective PhD advisers and discuss their research interests and potential PhD thesis topics well in advance of application deadlines.

Graduates of curricula in the physical sciences, mathematics, and computer science may be admitted with limited standing if they are judged to have the necessary background to profit from graduate work in electrical and computer engineering. Such students are admitted to full standing after completing course work to remove deficiencies.

Master of Science. The MS degree requires 8 units of credit and a thesis. At least 5 units must be at the 400 level in electrical and computer engineering. A master's thesis requiring 2 units of credit must be submitted by all candidates. Thesis credit is included in the required 8 units and may be applied to the 400-level course requirement. There is no final examination for the MS degree.

Doctor of Philosophy. Admission to PhD candidacy is based on the faculty's evaluation of the student's research potential, scholastic competence as evidenced by grades and class ranks, and satisfactory performance on the PhD qualifying examination. Students admitted with bachelor's degrees take this examination after completing 6 units of course work, including at least three 400-level courses in electrical and computer engineering. Students admitted with master's degrees take the examination after completing 2 units of course work, including at least one 400-level course in electrical and computer engineering. A minimum graduate GPA of 4.25, as well as a minimum GPA of 4.25 on 400-level course work, is required in order to be considered for admission to PhD candidacy.

The minimum requirements for the degree of doctor of philosophy are 8 units of course credit beyond the master's degree (or the equivalent), successful completion of the preliminary examination, 8 units of thesis research, a satisfactory thesis, and satisfactory defense of the thesis in a final examination. No foreign language proficiency is required.

Joint Degree Programs. A joint degree program leading to the degrees of Master of Science in Electrical Engineering and Master of Business Administration is offered in cooperation with the Department of Business Administration. Separately, the two degrees require a total of 24 units of credit; the joint degree program reduces the required credit to 19 units through an exchange of credits between the departments. Applicants must meet the admissions standards for both departments and be accepted by both departments. The degrees are awarded simultaneously after the requirements for both degrees have been met.

The department participates in the Medical Scholars Program, which allows students to pursue simultaneously the degrees of Doctor of Philosophy in Electrical Engineering and Doctor of Medicine. A separate application to the College of Medicine is required. Applicants must be accepted by the College of Medicine and by the department in order to participate in this program. For information, write to the Coordinator, Medical Scholars Program, College of Medicine at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801.

Extramural Study. Off-campus students who wish to pursue graduate degree programs from UIUC must apply and be accepted for admission as degree candidates in the Graduate College. It is recommended that students apply for admission before or during the semester in which they take their first off-campus courses. Students who are admitted as degree candidates after having

completed one or more extramural courses without being admitted to the Graduate College may petition the Graduate College to apply a maximum of 3 units of such course work toward the degree requirements. For further information, write to the Office of Continuing Engineering Education, 422 Engineering Hall, 1308 West Green Street, Urbana, IL 61801.

Financial Aid. Fellowships, research assistantships, and teaching assistantships (all of which include tuition and fee waivers) are available for the majority of students who are admitted. International applicants generally are not awarded teaching assistantships but are eligible for the other forms of financial aid.

ENGLISH

Head of the Department: Richard Wheeler
Director of Graduate Studies: James Hurt
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 210 English Building, 608 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: D. Baron, N. Baym, E. Brandabur, R. Carringer, H. Cole, J. Dundas, J. Dussinger, J. Frayne, J. Friedman, P. Friedman, P. Garrett, A. Guibbory, G. Hendrick, J. Hurt, D. Kramer, L. Lieberman, C. Neely, C. Nelson, C. Sanders, R. Shuman, J. Stillinger, J. Thompson, M. VanWalleghen, L. Waldoff, E. Watts, R. Wheeler
Associate Professors: G. Adelman, L. Chai, G. Colomb, M. Costello, L. Danielson, A. Deck, G. Douglas, C. Fontenot, R. Fumento, P. Graham, G. Hawisher, J. Hinely, D. Hogan, A. Kaufman, M. Kaufmann, D. Kay, J. Klein, C. Kyle, D. Majdiak, H. Marder, B. Michelson, M. Mullin, R. Parker, M. Shapiro, B. Smalley, J. Stottlar, Z. Sullivan
Assistant Professors: A. Anderson, M. Berube, E. Bohls, D. Cruickshank, R. Curry, D. Jacobson, B. Kelly, J. Lyon, M. Pemberton, N. Roberts, R. Sullivan, C. Wright

Graduate Degree Programs. The Department of English offers programs of study leading to the master of arts and the doctor of philosophy degrees. The PhD program is, in general, designed to educate and train teacher-scholars who will take positions in colleges and universities throughout the country. The master of arts programs may be either a first step toward the PhD degree or a final educational stage for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. There is no graduate creative writing program.

Admission. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least 20 semester hours of undergraduate college work in English and American literature, excluding required college work in rhetoric or composition. Applicants are required to submit Graduate Record Examination scores for the verbal and advanced tests. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been significantly higher than the 4.0 (A = 5.0) required by the Graduate College. The committee on admissions tends to select those applicants who have a solid array of undergraduate courses, knowledge of a foreign language, and real promise of earning degrees within a reasonable time. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Arts. A candidate for the AM in English must spend at least two semesters or the equivalent in residence and complete at least 8 units of course work. At least 4 units must be at the 400 level, and 3 of the 4 must be in English. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work. The student must pass, on formal examination, the master's area examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's degree must apply formally and is considered in competition with applicants who are taking the master's degree elsewhere. Seldom are applicants accepted with graduate averages below 4.5. A student who has taken the master of arts degree elsewhere must give evidence of knowledge of one foreign language on a level equivalent to that required of AM candidates in the English department's program. The student takes 8 units of course work, planned in consultation with an adviser. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There is one formal examination, the special field examination, which is usually taken as the student completes course work and prepares to write the thesis. The student then goes on to write a thesis under the direction of a committee composed of three professors. A total of 16 units beyond the master's degree, including thesis credits, are required. A full-time student can complete this program in three years beyond the master's degree.

Financial Aid. Financial aid is available to students in the form of fellowships, teaching assistantships, and waivers of tuition and service fees. Applicants are considered at only one time of the year, and the deadline for submitting applications is February 15. For complete information about the program, prospective applicants should write to the above address for the department's handbook on graduate studies in English.

ENGLISH AS AN INTERNATIONAL LANGUAGE

Director of the Division: Eyamba G. Bokamba
Correspondence and Information: Director, Division of English as an International Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Bokamba, C.C. Cheng, W. Dickerson, H. Hock, B. Kachru, Y. Kachru, C.-W. Kim, C. Kramarae, H. Maclay, S. Savignon, L. Zgusta
Associate Professors: L. Bouton, J.R. Cowan, G. Cziko, M. Mack, E. McClure
Assistant Professors: D. Cruickshank, F. Davidson, S. Gonzo, N. Markee, S. Taylor
Emeritus Professor: K. Aston

Graduate Degree Program. The Division of English as an International Language offers a Master of Arts in the Teaching of English as a Second Language (MATESL).

Admission. In addition to meeting the Graduate College admission requirements, applicants should present evidence of appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher-training curriculum in one of the above. Native speakers of English must have studied at least one foreign language for four semesters or the equivalent, or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English by attaining a score of at least 570 on the TOEFL examination. All applicants to the MATESL curriculum who are not native speakers of English must take the TOEFL examination, even when the requirement for that examination has been waived by the University itself.

Master of Arts in the Teaching of English as a Second Language. The program leading to this degree requires candidates to complete a minimum of 10 units of course work and either a written comprehensive examination or a thesis. Usually candidates can meet all degree requirements in two years.

The MA program offers two separate curricula or tracks. One track is designed for candidates whose principal interests are in language pedagogy and related research. The other track encourages candidates to concentrate more heavily on applied research in various aspects of English studies, such as those listed below under faculty specializations. A detailed description of the two MA tracks is available upon request.

The doctor of philosophy degree, an option in applied linguistics and the teaching of English as an international language, is available through the Department of Linguistics and the interdisciplinary program in Second Language Acquisition and Teacher Education (SLATE). Members of the graduate faculty of the Division of English as an International Language are available to serve on doctoral committees. Faculty specializations include neurolinguistics, sociolinguistics, psycholinguistics, language testing, contrastive discourse, lexicography of English, stylistics, language processing, reading, literacy, pragmatics, computers in second language acquisition and learning, methodology of language teaching, curriculum design, and English in the world context. Applicants interested in working toward a doctorate in linguistics should write to the Head, Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Language Building, 707 South Mathews Avenue, Urbana, IL 61801. Those interested in SLATE should write to the Chair, SLATE Program, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801.

Financial Aid. Financial assistance is not usually awarded during a MATESL candidate's first semester. Exceptions to this policy are sometimes made when an applicant has had extensive experience in teaching English as a second language or has an outstanding academic record. A limited number of University fellowships are available for exceptionally qualified candidates. Teaching assistants teach students in the division and in the Intensive English Program, which is a constituent unit of the division.

ENVIRONMENTAL STUDIES

Director of the Institute: Roger A. Minear
Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 1101 West Peabody Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.J. Burdge, D.M. Gardner, L.G. Hansen, L.D. Hopkins, R.A. Larson, R.A. Minear, M.J. Plewa, G.L. Rolfe, W.D. Seitz
Associate Professors: B.M. Francis, E.H. Jeffery, C.D. Kolstad, D.G. Simpson
Assistant Professors: J.M. Alho, J.L. Cottett, Jr., K.N. Paige, S.L. Schantz, J. Vining
Emeritus Professors: B.B. Ewing, R.L. Metcalf

The Institute for Environmental Studies coordinates and supports programs of research, teaching, and public service in areas related to environmental quality. Although the institute does not offer degree programs, it offers graduate-level courses on environmental subjects and provides opportunities for students working within specific disciplines to participate in interdisciplinary environmental research.

The institute's close ties with many other campus units make it possible for students seeking graduate degrees from those units to engage in environmental research within the institute's varied interdisciplinary program. Current scholarly research at the institute addresses a wide range of significant environmental problem areas, including environmental toxicology, environmental mutagens and carcinogens, water quality and water resources management, effects of pollution on biological systems, environmental chemistry, social and economic impacts of resource development, methods of environmental risk assessment, analysis of environmental perception and decision making, economics of environmental regulation, and environmental quality management. Institute faculty—who represent such diverse disciplines as genetics, chemistry, pharmacology, teratology, ecology, engineering, economics, leisure studies, psychology, sociology, and statistics—direct graduate research of students enrolled in a wide variety of degree programs on campus.

The interdisciplinary environmental toxicology program, coordinated by the institute, offers specialized training in the study of toxic substances in the environment. This program has recently been expanded to provide a concentration in the health effects of environmental toxicology. Graduate students with backgrounds in fields such as the life sciences, health sciences, chemistry, or engineering are eligible to apply for admission to the program. Faculty from several University schools and colleges participate in the program's teaching and research

activities and serve as research advisers to its students. In addition to completing a core of course work in environmental toxicology, degree candidates must satisfy the requirements of the cooperating graduate unit in which they are enrolled. Financial support is available through a limited number of graduate research assistantships for which students may apply through the institute. A brochure describing the program and the requirements for admission and graduation is available from the institute.

The institute's interdisciplinary program in environmental mutagens and carcinogens complements the graduate degree specialization in environmental toxicology described above. The objectives of this program are to develop methods to detect and identify mutagenic substances; determine their sources, transport, transformations, and fate in the environment; evaluate exposures to target organisms; and evaluate the economic and social impacts of these exposures.

Further information on opportunities for graduate education in environmental studies at the University of Illinois at Urbana-Champaign is provided in *Environmental Graduate Programs*, a brochure available from the institute. Also available is a comprehensive listing of environmental courses currently offered by the institute and by other campus units.

EXTENSION EDUCATION

Head and Graduate Adviser: Dale A. Law
Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 124 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

Graduate Degree Program. The Master of Extension Education degree program is a professional program providing advanced study in agriculture and in human resources and family studies, including further study in the social sciences.

Admission. Applicants are expected to possess a bachelor's degree in agriculture, home economics, or a closely related field, and to meet the Graduate College admission requirements.

Degree Requirements. The program consists of a minimum of 8 units with a thesis or 9 units without a thesis. Three units must be in 400-level courses, with 2 of these in the major field. A major, consisting of 4 units, may be taken in agriculture, human resources and family studies, or the social sciences. Students majoring in agriculture or human resources and family studies select 4 additional units from the social sciences; those majoring in the social sciences select 4 additional units from agriculture or human resourses and family studies. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. At least 4 units must be earned in residence on the Urbana-Champaign campus.

FINANCE

Chair of the Department: Charles M. Linke
Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820-6271

GRADUATE FACULTY

Professors: P.P. Boyle, W.R. Bryan, I.O. Bull, P.F. Colwell, J.E. Finnerty, J.A. Gentry, J. Lakonishok, C.M. Linke
Associate Professors: R.E. Cannaday, S.P. D'Arcy, M.J. Lynge, Jr., H.Y. Park, G.G. Pennacchi, J.R. Ritter, D.T. Whitford
Assistant Professors: L.K. Chan, Y. Dokko, B. Flesaker, V.G. France, L.J. Quigg, A. Sarkar

Graduate Degree Programs. The Department of Finance offers graduate work leading to the master of science and doctor of philosophy degrees. The following fields are available for specialization: financial institutions, corporate finance, investment, insurance, and urban economics and real estate.

Admission. The minimum required admission grade-point average is 4.0 (A = 5.0). To be admitted without deficiencies, the applicant should have completed an undergraduate course in computer science, financial accounting, managerial accounting, principles of economics, calculus (two semesters), probability and statistics (two semesters), and two courses in financial management. Courses to remove deficiencies may be taken after beginning the program, but such courses will not count toward the departmental requirements for graduation. Candidates are required to submit Graduate Management Admission Test scores. The score will be used by the Graduate Standards Committee, along with other information, in evaluating the applicant's qualifications for graduate study.

Master of Science. A candidate for the master's degree in finance must spend at least two semesters in residence. The credit requirement for this degree is 8 to 10 units. Two units of economic theory are usually required. However, students with sufficient economic theory course work may have this requirement replaced by other economics course work, additional finance course work, or additional elective course work, as determined by the chair of the department. The department has an optional thesis plan for the master's degree. The credit requirement for this option is 8 units. Three of the 8 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work. The credit requirement for the nonthesis option is 10 units; 3 of these 10 units must be in courses numbered in the 400 series, and 2 of these 3 units must be in finance course work.

Master of Science in Finance and Master of Architecture. The Department of Finance and School of Architecture offer a joint master's program. Initially individual requirements are the same for each individual program. Program prerequisites are a baccalaureate degree in architecture, including Computer Science 102 and Mathematics 120 to 132; background courses in finance met by graduate course requirements; 2 units of economic theory; 3 units of quantitative methods; 4 units in finance; $4^{3}/_{4}$ units of architectural options courses; 3 units of the financial management sequence in business management; and other elective requirements. The joint master's program is granted when these requirements, totaling $21^{3}/_{4}$ units, are completed.

Doctor of Philosophy. The first stage toward the degree of doctor of philosophy ends when the candidate receives a master's degree or earns the equivalent credit; the second stage comprises 8 units of work, fulfillment of departmental requirements, and successful preliminary examinations; the third stage includes research and seminars (8 units), preparation of the dissertation, and the final examination. A student plans courses and research with his or her adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the department. The student should become familiar with these requirements and satisfy them as soon as possible.

A candidate for the doctorate who has received a master's degree from a recognized institution receives the equivalent of 8 units of credit for that work. If such credit is to be used in partial fulfillment of the requirements for the doctorate, the candidate is examined on the content of the courses involved at the time of the preliminary examinations.

To enter the third stage of a doctoral program, a candidate must pass preliminary examinations to test his or her qualifications for further advanced study and research. The examinations are written and oral. For preliminary examination, candidates are responsible for four fields: economic theory, two finance areas, and one elective area.

The doctor of philosophy is primarily a research degree, and the candidate must demonstrate the capacity for independent research by producing an original thesis on a topic within his or her major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The candidate is admitted to the final examination by the dean of the Graduate College upon completion of the dissertation and the recommendation of the department.

FOOD SCIENCE

Head of the Department: Bruce M. Chassy
Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 103 Agricultural Bioprocess Laboratory, 1302 West Pennsylvania Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L. Birch, H.P. Blaschek, B.M. Chassy, M. Cheryan, J.W. Erdman, P.V. Johnston, B. Klein, S.E. Martin, A.I. Nelson, R. Nelson, T. Nishida, E.G. Perkins, A.J. Siedler, R. Villota, W.J. Visek, L.S. Wei, L.D. Witter
Associate Professors: C. Argoudelis, W. Artz, I. Baianu, B.H. Cho, S.J. Schmidt
Assistant Professors: M.D. Berber-Jiminez, L. Dunn, R. Jimenez-Flores

Graduate Degree Programs. The Department of Food Science offers graduate work leading to the master of science and doctor of philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: processing-engineering, chemistry, microbiology, and nutrition.

Admission. In addition to meeting the Graduate College admission requirements, a student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies may be removed with graduate credit courses designed for this purpose.

Master of Science. To obtain a master's degree, a student must have 2 3/4 units in food science. The remainder of the 8 units of credit required consists of graduate courses selected from inside or outside the department that are appropriate for the training and development of the student in the field of specialization. At least 3 units must be at the 400 level (1/4 unit of this is seminar). A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required. Students whose native language is not English are required to demonstrate competence in English by passing English as a Second Language 111.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the doctor of philosophy degree must have additional credit in seminar (1/4 unit) and thesis research (8 units). The remainder of the 16 units required for the degree consists of graduate courses selected from inside or outside the department that are appropriate for training in the student's field of specialization. The student must demonstrate proficiency in one foreign language or complete a special option approved by the department, which is not counted as part of the 16 required units of credit. Students whose native language is not English must pass English as a Second Language 401. Upon completion of all necessary formal courses and special options, the student is required to take an oral preliminary examination. After passage of the preliminary examination, the student's activities are primarily devoted to thesis research. Upon submission of the thesis, the candidate is admitted to the final oral examination before a graduate faculty committee. The PhD degree in food science may be combined with the study of medicine in the University of Illinois at Urbana-Champaign Medical Scholars Program.

Specialization in Genetics.* The Department of Food Science offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Financial aid for graduate students in food science is available in the form of fellowships, teaching and research assistantships, and tuition and partial fee waivers. Qualified

candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally receive a full tuition waiver and a partial fee waiver, as well as a stipend.

**A proposal to establish a specialization in genetics is pending campus approval.*

FORESTRY

Head of the Department: G.L. Rolfe
Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 110 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Chow, J.O. Dawson, G.L. Rolfe, R.M. Skirvin
Associate Professors: S. Brown, J.M. Cheeseman, M.B. David, G.Z. Gertner, L.R. Iverson, G.A. Mendoza, D.W. Onstad, B.A. Orland
Assistant Professors: R.J. Brazee, E.H. Delucia, D.E. Harry, D.A. Kovacic, T.D. Marty

Graduate Degree Program. The Department of Forestry offers graduate work leading to the master of science degree. The doctor of philosophy degree is not currently offered by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department or is on the staff of an interdisciplinary doctoral program. Such areas of study include ecology, economics, genetics, physiological and molecular plant biology, soils, and wood science.

Admission. The prerequisite for graduate study in the Department of Forestry is a bachelor's degree in forestry or a related field. A grade-point average of 4.0 (A = 5.0) in the last 60 semester hours of undergraduate work plus any graduate work completed is required. Applicants who do not meet the minimum requirements are encouraged to take the Graduate Record Examination, as exceptions to these prerequisites are possible on an individual basis. Applicants whose native language is not English must score at least 550 on the TOEFL examination.

Master of Science. To qualify for the master of science degree, a student must earn at least 8 units of graduate credit, with at least 3 units in courses at the 400 level. At least half of the 8 units must be from courses meeting on the Urbana-Champaign campus or from courses approved by the Graduate College for residence credit, although meeting at other locations. Depending on their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student in such areas as biometrics, ecology, economics, genetics, management, physiology, policy, soils, statistics, and wood science.

In most cases, a thesis is required, but it may be waived if such waiver will result in a more appropriate program for the individual student. The forestry seminar and a graduate-level statistics course are required of all graduate students. There are no language or qualifying examination requirements.

Specialization in Genetics.* The Department of Forestry offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Research Interests. Major areas of faculty research include agroforestry; atmospheric deposition effects on forest soils; ecology of forested bottomlands; economics and management of Illinois forests in particular and national forests in general; economics of multiple use; biodiversity and tropical forestry; forest-soil relationships; forest tree improvement; management of forest

vegetation in stressed urban settings; modeling of forest growth, inventory, and analysis; oak regeneration; population and molecular genetics of forest trees; properties of wood composite materials; remote sensing and geographic information system analysis of forested landscapes; resource education; symbiotic nitrogen fixation by trees and shrubs; tropical forest ecology; utilization of low-grade hardwood species and plant residues; water quality and watershed management; and wood mechanics.

Financial Aid. Besides University and other fellowships for which graduate students may compete, the Department of Forestry offers the Spaeth-Boggess Fellowship and a number of graduate research assistantships ranging from 25- to 67-percent time. Graduate assistants are exempt from tuition and the service fee, but not from the health service and insurance fees.

**A proposal to establish a specialization in genetics is pending campus approval.*

FRENCH

Head of the Department: Emile Talbot
Director of Graduate Studies: Stanley Gray
Correspondence and Information: Department of French, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Accad, H. De Ley, P. Gaeng, J. Jahiel, A.K. Mortimer, R.J. Nelson, S. Savignon, E. Talbot
Associate Professors: S. Gray, A. Hadley, F. Jenkins, D. Kibbee, M. Rosello
Assistant Professors: K. Fresco, D. Lepetit, J.P. Mathy, S. Shinall, Y. Smith

Graduate Degree Programs. The Department of French offers graduate courses leading to the master of arts and the doctor of philosophy degrees. Candidates for the AM degree may specialize in literature, in expanded French studies, or in French linguistics or in the learning/teaching of French. Candidates for the PhD degree may choose one of four specializations: literature, expanded French studies, French linguistics, or second-language learning and teaching.

Admission. Students usually considered for admission to the AM program have an overall undergraduate admission average of 4.0 (A = 5.0) with an average in French of 4.5. Students should usually have had a college major in French. Entering students are given a diagnostic test to determine whether remedial study in French language courses is necessary. Some knowledge of other Romance languages and literatures is desirable. Students seeking admission to the PhD program with a master of arts degree earned elsewhere are expected to have a 4.5 grade-point average in graduate courses. The master's degree should be in French literature or in French studies. Candidates seeking admission to the PhD concentration in second-language learning and teaching may hold an MAT degree.

Master of Arts. Candidates in all master's programs must complete 8 units of course work and pass an AM examination. Candidates in literature must take an AM examination based on a reading list covering the field of French literature. The examination in expanded French studies covers, in addition to readings in the field of French literature, material bearing on the candidate's field of specialization in French culture or related disciplines. The examination in linguistics is based on a list of readings in linguistics and in literature. The examination in French learning/teaching includes readings in second-language acquisition and teaching methods in addition to selected readings in French literature and/or civilization. Candidates in all programs are required to demonstrate, at the time of the master's examination, an ability to communicate effectively in both written and oral French.

Doctor of Philosophy. Candidates in all programs must complete 16 units beyond the master's degree, including a minimum of 8 units of course work beyond the AM degree, and must pass

a preliminary examination and write an acceptable thesis. Although teaching is not a general Graduate College requirement, the Department of French requires PhD candidates to do some teaching as part of their academic work, because such experience is considered a vital part of the graduate program.

PhD in Literature. This program is designed to prepare literary scholars and teachers. Candidates are required to include courses in research methods and textual criticism, linguistics or linguistically oriented textual theory, Old French, and French literature. Reading proficiency in one language other than French or English is required, as well as one year of college Latin or the equivalent.

PhD in Expanded French Studies. The doctoral program in expanded French studies allows for research in francophone literature or in the relation of French literature to some nonliterary discipline. Two of the required 8 units of course work beyond the AM degree may be taken in other departments or programs when available and approved by the graduate adviser. Candidates are required to include courses in French literature. Reading proficiency in one language other than French or English and one year of college Latin or the equivalent are required; or students may demonstrate high proficiency in one foreign language.

PhD in French Linguistics. This is a graduate curriculum that offers training in French historical and descriptive linguistics and philology. Students in this program are required to take 3 units in French literature and may elect up to 2 units of related work in other departments, in addition to a required course in the structure of French and either the history of French or a course in Old French. At the doctoral level, a concentration in Romance linguistics is available in cooperation with the Department of Spanish, Italian, and Portuguese; the Department of Linguistics; and the Department of the Classics.

PhD in Second-Language Learning/Teaching. An interdisciplinary concentration in second-language learning/teaching is available to candidates with an AM or MAT degree in French and at least one year of experience in teaching French as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology, in addition to advanced study in French language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics.

Financial Aid. Assistantships and University fellowships are awarded. Several graduate students each year spend the school year in France under a graduate exchange agreement with the French government. The department has also initiated exchange programs with the University of Metz and the University of Dijon, France, and the University of Liege, Belgium.

GENERAL ENGINEERING

Head of the Department: T.F. Conry
Correspondence and Information: Graduate Programs, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, 104 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: T.F. Conry, W.J. Davis, E.N. Kuznetsov, J.V. Medanic, L.D. Metz, M.W. Spong
Associate Professors: S.A. Burns, O. Coskunoglu, D.E. Goldberg, W.B. Hall, M.H. Moeinzadeh, D.C. O'Bryant, M.H. Pleck, H.L.M. dos Reis, T.R. Woodley, L. Wozniak
Assistant Professors: Y.S. Kim, M.G. Strauss, S.D. Thompson, D.L. Thurston

Graduate Degree Program. The Department of General Engineering offers graduate study leading to the degree of master of science. The program consists of a core of required courses including a thesis or design project with supplementary courses selected by the student together with an adviser.

The program offers an approach to systems engineering and engineering design that crosses

disciplinary lines. Graduates of the program are prepared to enter professional engineering positions in industry, government, and private practice. Graduate study and research can be pursued in the following fields: computational design, optimization, design systems, manufacturing systems, nondestructive testing and evaluation, robotics and control, system dynamics and simulation, operations research/management science, and biomechanics.

Admission. Applicants who have completed degree requirements in an accredited engineering program or its equivalent are eligible to apply for admission. Qualifications for admission include a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work. The Graduate Record Examination is not required but is highly recommended. For students whose native language is not English, the department requires a minimum TOEFL score of 600.

Master of Science. The minimum requirement for the degree is 8 units of credit with a thesis or 9 units without a thesis. Each candidate must successfully complete a minimum of 2 units of project design for the nonthesis degree or one unit of thesis research for the thesis degree. Each candidate must also successfully complete at least 7 additional units of graduate course work, of which at least 3 units must be at the 400 level.

It is possible to pursue the MS in General Engineering and the MBA degree simultaneously. The total time required is less than that needed to obtain both degrees independently. A total of 18 units of credit is required, including 4 units of work consistent with normal MSGE requirements, 12 units of MBA core courses, and 2 units of project design, General Engineering 497. Separate admission to both departments is required, although only one application is necessary.

An extramural MSGE program is available to off-campus students in videotape and telecommunications formats.

Financial Aid. Qualified students may apply for financial aid in the form of teaching and research assistantships and waivers of tuition and service fees.

GENETICS SPECIALIZATION *

Correspondence and Information: Genetics Program, School of Life Sciences, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

Program Committee: The Genetics Program is overseen by a committee of faculty members representing the three participating colleges (Agriculture, Liberal Arts and Sciences, Veterinary Medicine).

Participating Departments. Agronomy; Animal Sciences; Biochemistry; Cell and Structural Biology; Ecology, Ethology, and Evolution; Entomology; Food Science; Forestry; Horticulture; Microbiology; Physiology and Biophysics; Plant Biology; Plant Pathology; Veterinary Biosciences; and Veterinary Pathobiology.

Graduate Degree Programs. The principles of genetics are integral to many fields of biological sciences. For this reason, an interdisciplinary concentration in genetics is available for students enrolled in master's or doctoral degree programs in the participating departments listed above. All students must become proficient in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. The specific courses and program emphasis vary by department because of the broad nature of genetics research.

Admission. The Genetics Program does not independently admit students or confer graduate degrees. Prospective students should address inquiries to the program office or to any of the participating departments. Students are admitted to the program after their acceptance by one of the participating departments and review by the Genetics Program Executive Committee of the Graduate College. Students admitted to the program must have completed minimal course work in calculus, computer science, basic genetics, and biochemistry. All degree applicants must complete the requirements of the department in which they are enrolled in addition to those of the Genetics Program.

**A proposal to establish a specialization in genetics is pending campus approval.*

GEOGRAPHY

Head of the Department: J.A. Jakle
Correspondence and Information: Graduate Adviser, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: B.M. Hannon, G.J.D. Hewings, J.O. Huff, J.A. Jakle, D.L. Johnson, J. Thompson
Associate Professors: T.J. Bassett, T.D. Frank, S.A. Isard, C.E. Thorn
Assistant Professors: A.P. Elhance, B.L. Rhoads, D. Wilson

Graduate Degree Programs. The Department of Geography offers work leading to the master of arts, master of science, and doctor of philosophy degrees. The department's specializations are organized into four programs: (1) *economic geography/regional science* (industrial location, transportation, techniques of urban and regional analysis, urban systems); (2) *historical and cultural geography* (historic landscapes, urban morphology, cultural ecology of economic development, technology and environmental change); (3) *physical geography* (fluvial, periglacial, soil, Quaternary Studies, remote sensing, geographic information systems); and (4) *urban and rural settlement and development* (development theory, international conflicts, migration, urban systems). Detailed descriptions of these programs may be obtained from the departmental office.

Departmental Facilities. The department houses several laboratories: (1) the Spatial Data Analysis Laboratory is a facility for analysis of spatial patterns derived from maps, aerial photographs, and satellite images using computer cartography/image processing workstations; (2) the Cartography Laboratory has darkroom and drafting facilities; (3) the Soil Laboratory includes an X-ray diffractometer and a vacuum spectrometer; (4) the Geographic Information Systems (GIS) Laboratory is equipped with several networked SUN 360 machines and a wide array of software.

Map and Geography Library. Within the University's outstanding library is the Map and Geography Library, which has an excellent collection of geography monographs, periodicals, and more than 500,000 maps and aerial photographs.

Admission. Students applying for admission to the master's program are expected to have a strong undergraduate background in geography and/or related disciplines. In addition to other Graduate College admission requirements, a grade-point average of at least 4.0 (A = 5.0) in the undergraduate major is required. PhD candidates are generally expected to have at least a 4.5 average in previous graduate work.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the master of science; others receive the master of arts. The Graduate College requirements for the master's degree apply.

Doctor of Philosophy. Admission presupposes distinction in completing the master's program in geography at the University of Illinois at Urbana-Champaign or its equivalent. In the doctoral program, the student develops depth in the program chosen for specialization and further advances in research competence. Of the 16 units required beyond the master's degree, 4 units of study in allied disciplines and a minimum of 6 additional units in geography are required. A student must complete the course requirements as determined by an individually planned program, initiate and complete research projects, and qualify for candidacy by passing the preliminary examination. Although there is no departmental foreign language requirement, students may offer a foreign language as a research tool.

Financial Aid. Fellowships, teaching and research assistantships, and waivers of tuition and some fees are available in the department. See the discussion on financial aid on page 25 for a description of the provisions of these awards.

GEOLOGY

Head of the Department: R. James Kirkpatrick
Associate Head of the Department: W. Hilton Johnson
Correspondence and Information: Graduate Secretary, Department of Geology, University of Illinois at Urbana-Champaign, 245 Natural History Building, 1301 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.E. Anderson, T.F. Anderson, D.B. Blake, R.L. Hay, W.H. Johnson, R.J. Kirkpatrick, G.deV. Klein, R.L. Langenheim, C.J. Mann, A.S. Nieto, P.A. Sandberg
Associate Professors: S.P. Altaner, J.D. Bass, C.M. Bethke, W.P. Chen, A.T. Hsui, S. Marshak
Assistant Professors: C.Y. Chen, T.J. Clarke

Graduate Degree Programs. The Department of Geology offers programs leading to the Master of Science in Geology, the Doctor of Philosophy in Geology, and the Master of Science in the Teaching of Earth Science. Students have a wide variety of choices in their courses and research programs. Departmental research programs include many aspects of geology, geochemistry, and geophysics.

Admission. The admission requirements of the Graduate College apply. In addition, scores for the aptitude test of the Graduate Record Examination are required for admission to graduate work in geology, as well as completion of at least one year of study in college-level calculus, chemistry, and physics. For more information, write to the graduate secretary.

Master of Science. The MS program in geology consists of a thesis option and a nonthesis option. The thesis option requires completion of at least 8 units of graduate credit and an MS thesis. Credit includes 6 units of formal course work and no more than 2 units of MS thesis research. In all cases, at least 3 units of formal course credit must be taken within the geology department, and at least 3 units of formal course work must be completed at the 400 level. Before finishing the degree, each student must present a colloquium on the thesis research. The nonthesis option requires 9 units of credit, including at least 8 units of formal course work and 1 unit of research/independent study (Geology 493) requiring a written report. At least 3 units of the formal course work must be completed in the department, at least 3 units must be completed at the 400 level, and no more than 2 units of credit are allowed for 300-level courses required in any of the options of the Curriculum in Geology and Geophysics at UIUC. This option is intended as a terminal degree for students preparing for professional work in environmental and engineering geology and applied geophysics. Students in both options must maintain a minimum grade-point average (GPA) of 4.0 (A = 5.0). If the GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter. The MS degree usually is completed in about two years.

Master of Science in the Teaching of Earth Science. Candidates must earn 8 units of graduate credit, including 4 units in geology, 2 units in other earth science areas, and 2 units in education. At least 3 units of formal course work must be at the 400 level. In addition, candidates must fulfill the requirements to be certified to teach at the secondary school level in Illinois. A student must maintain a minimum GPA of 4.0 (A = 5.0). If the GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter.

Doctor of Philosophy. The PhD degree requires at 1east 24 units of graduate credit and completion of a PhD thesis. At least 10 of these units must be formal course work, with the remainder as independent study and thesis research. A minimum of 8 units must be PhD thesis research. At least half of the formal course work must be at the 400 level, at least 3 courses must be taken in the geology department, and at least 2 courses (totaling at least $1^1/_2$ units) must be taken outside the geology department. Credit for MS thesis research is limited to a maximum of 2 units. Incoming students with an MS degree are usually allowed 8 units of credit towards the

PhD (6 units of formal courses and 2 units of MS thesis research). There is no foreign language requirement. A student must maintain a minimum GPA of 4.0 (A = 5.0). If the GPA falls below this minimum after 3 or more units of graded course work, it must be raised to or above 4.0 after the completion of 3 additional units of graded course work and must be maintained at or above the minimum thereafter. PhD students are evaluated by three oral examinations: a qualifying exam, a preliminary exam, and a final exam. The qualifying exam tests the breadth of knowledge as well as the ability to define and defend a research proposal in a specialized field at an early stage of graduate study. The preliminary exam tests advanced knowledge in a specialized field and the ability to define and defend a PhD dissertation proposal. The final exam tests the ability to complete and defend PhD dissertation research.

Financial Aid. Candidates for graduate degrees are usually supported through fellowships, research assistantships, teaching assistantships, waivers of tuition and service fees, and work-study programs. Fellowships and assistantships include tuition and fee waivers. Awards for financial assistance are based principally on a candidate's academic record, statement of plans, and letters of reference. Some part-time assistants are employed by the State Geological Survey located on campus.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: James M. McGlathery
Correspondence and Information: Head, Department of Germanic Languages and Literatures, University of Illinois at Urbana-Champaign, 3072 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, U.H. Gerlach, H.G. Haile, W. Hollerer, M. Kalinke, H. Knust, R. Lorbe, J.W. Marchand, J.M. McGlathery, K.-H. Schoeps
Associate Professors: J. Lalande, R. Wright
Assistant Professors: D. Chirita, M. Wade, A.E. Wright

Graduate Degree Programs. The Department of Germanic Languages and Literatures offers graduate programs leading to the degrees of master of arts, Master of Arts in the Teaching of German, and doctor of philosophy.

Master of Arts. Applicants should have completed undergraduate studies similar to the concentration in German at the University of Illinois at Urbana-Champaign, have a grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate course work plus any graduate work completed, and be able to follow lectures in the German language. Acquaintance with German history and culture in their relation to the general European background is desirable. Admission to the program is on a competitive basis.

Candidates for the Master of Arts in Germanic Languages and Literatures may emphasize either German or Scandinavian literature or linguistics. All candidates must take course work in both literature and linguistics.

The master's degree requires 8 units of graduate work, although deficiencies in undergraduate preparation may necessitate more than 8 units to meet the requirements. Residence and other requirements of the Graduate College must be met. Candidates for the AM degree must demonstrate proficiency in reading one language other than English and German (usually French). Required courses (or approved equivalents) are German 365 and 366 (Structure of the German Language I, II), German 311 and 312 (German Literature 750-1770), German 415 (Middle High German) or Scandinavian 405 (Old Norse-Icelandic), German 420 (History of the German Language), German 410 (Introduction to Graduate Study), and two graduate literature courses at the 400 level. Electives may be chosen from within or from outside the department with the approval of the graduate adviser. The degree is awarded upon the successful completion of a three-hour written and a one-hour oral comprehensive examination, or upon successful defense of a thesis. More detailed information may be obtained from the departmental office.

Master of Arts in the Teaching of German. Applicants must meet the same admission standards as those for the Master of Arts in German. Candidates for the MAT degree must earn 5 units in German emphasizing either language and linguistics or literature and culture, 2 units in approved courses in educational policy studies, 1 unit of studies in educational foundations, and 2 courses in foreign language education. Candidates must also complete all undergraduate requirements for a teaching certificate, although no graduate credit is given for undergraduate courses. In some cases, with proper advance approval, graduate courses may be applied to the teaching certification requirements. Residence requirements are those of the Graduate College. The degree is awarded after the successful completion of a three-hour written and a one-hour oral examination. More detailed information is available from the departmental office.

Doctor of Philosophy. Applicants must meet the admission standards outlined for the master of arts and, in addition, hold a Master of Arts in German (or equivalent) with a graduate grade-point average of 4.5 (A = 5.0). Admission to the program is on a competitive basis.

Candidates for the PhD in German may specialize in older German literature, modern German literature, Germanic linguistics, German and Scandinavian literature, or German language pedagogy.

Students working toward the PhD degree must have completed all requirements for the AM degree given above and must complete an additional 8 units of course work approved by the graduate adviser. Residence requirements are those of the Graduate College. Candidates must demonstrate proficiency in reading two languages other than English and German that are considered useful in their area of specialization.

After passing the written preliminary examinations (three three-hour comprehensive examinations), the student is admitted to the oral examination, the successful completion of which admits the student to candidacy for the PhD degree. The candidate must then complete 8 units of thesis research and successfully defend the thesis in an oral examination. All candidates for the PhD degree must have taught the equivalent of three one-semester courses on the college level (i.e., teaching one-half time for one academic year) before being admitted to the final oral examination (thesis defense). An additional option in Second Language Acquisition in Teacher Education (SLATE) is available to candidates with an AM degree (or equivalent) in German and at least one year of experience in teaching German as a second language. Candidates selecting this option are required to complete courses in psycholinguistics, education, and language teaching methodology in addition to advanced study in German language and culture. Also required are 4 units in research methodology selected from one of several options including linguistics, psychology, computer science, or statistics. More detailed information is available from the departmental office.

Research Interests. The department faculty includes nationally and internationally recognized scholars in all areas of research within the field. These areas include older and modern German literature, medieval studies, Scandinavian literature, German film, computerized instruction, historical and synchronic Germanic linguistics, and German language pedagogy. The University Library has one of the nation's outstanding collections of works pertaining to study and research in German and other literatures of all periods and in Germanic and general linguistics.

Financial Aid. Teaching assistantships are awarded on a competitive basis to promising candidates with strong academic records. Preference may be given to students who have lived in a German-speaking country or have had some teaching experience. Teaching assistantships are usually awarded at one-half time for the academic year. Each year the department may nominate one or more outstanding students for a University fellowship. A limited number of tuition and service fee waivers may also be available. Full details on amounts of financial aid and time limitations for eligibility may be obtained from the departmental office.

For continuing graduate students, the awarding of financial aid of all types is contingent upon the maintenance of satisfactory progress toward a degree.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: Robert F. Rich
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.F. Giertz, S.K. Gove, P.F. Nardulli, R.F. Rich

The Institute of Government and Public Affairs conducts policy-oriented research and public service. Primary emphasis is on research into public policy issues at the state and local levels, especially as these relate to Illinois. Public service activities arise from and contribute to institute research through contact with public officials and the identification of research problems. Each year the institute has several affiliate faculty members from related UIUC departments, as well as from other universities. The institute offers no courses, but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research are published in internal and external journals and books.

HEALTH AND SAFETY STUDIES

See Community Health.

HISTORY

Chair of the Department: Charles C. Stewart
Director of Graduate Studies: James R. Barrett
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.L. Arnstein, J.R. Barrett, R.M. Berdahl, P.P. Bernard, J. Buckler, R.W. Burkhardt, Jr., O.V. Burton, D.E. Crummey, L.E. Eastman, P.B. Ebrey, K.A. Hitchins, F.C. Jaher, R.C. Jennings, R.W. Johannsen, R.A. Jones, B.B. Kling, D.P. Koenker, J.L. Love, J.A. Lynn, R.M. McColley, J.P. McKay, N.G. Parker, D.E. Queller, P.W. Schroeder, C.C. Stewart, R.P. Toby, J.E.K. Walker, W.C. Widenor
Associate Professors: P. Fritzsche, J. Haboush, C.M. Hibbard, M.H. Leff, D. Littlefield, E.M. Melhado, R.E. Mitchell, D. Prochaska, J.H. Pruett, B. Uroff
Assistant Professors: W. Chow, K. Cuno, J. Hanes, N. Jacobsen, M. McLaughlin, S. Michel, A. Verner

Graduate Degree Programs. The Department of History offers graduate courses leading to the master of arts and the doctor of philosophy degrees, complete details of which may be found in the department's brochure on graduate study in history. The master of arts degree may be either the first stage in preparation for the degree of doctor of philosophy or a terminal degree.

Approved areas of specialization are ancient Greece; ancient Rome; Middle Ages; Renaissance and Reformation; Europe and dependencies, 1648-1815; Europe and dependencies since 1789; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; Colonial North America and Early United States to 1830; United States since 1815; Latin America; history of science; international relations since 1871; military history; Afro-American history; history of medicine; and history of women. Topical fields may also be arranged with the consent of the graduate advisers.

Admission. For the AM program: a grade-point average of 4.25 (A = 5.0) during the last two years of undergraduate work, a reasonable amount of course work in history, and Graduate

Record Examination scores (verbal and quantitative mandatory; history optional). For the PhD program: a grade-point average of 4.5 for previous graduate-level work and Graduate Record Examination scores (as above). Undergraduate language preparation may be weighted heavily, depending upon the field of specialization.

Master of Arts. Candidates are expected to take at least 2 units in each of two of the fields of specialization listed above. A minimum of 8 units is required, 4 of which must be at the 400 level (excluding History 498). One of the 8 units must be History 490 (history and social theory), 491 (quantitative history), or 496 (historiography). At least one research seminar with a grade of B or better must be included. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement and may carry no more than 2 units of credit. A candidate must demonstrate ability to read one foreign language related to his or her field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the PhD degree needs a minimum of 24 units (including those offered for the AM degree), of which 8 may be for thesis research (History 499). For students who enter the graduate program without an AM in history, these must include three research seminars, History 496, either History 490 or History 491, and three additional courses at the 400 level (not including History 499). For students entering the graduate program with an AM in history, these must include two research seminars, History 496, either History 490 or History 491, and two additional courses at the 400 level (not including History 499). History 498, while required for students serving as teaching assistants, cannot be counted toward fulfilling these requirements. A candidate must demonstrate ability to read two foreign languages related to his or her field of interest, as approved by the graduate advisers. In certain circumstances, a student in American or British history may substitute courses in quantitative skills for the second language. For the preliminary examination, the candidate customarily offers three fields in history, of which one must involve a period of time before 1815. At least two geographical areas must also be represented by the fields offered for the examination. One of the three fields, however, may be in a specialization outside the Department of History or may be a field of history specially designed by the candidate in consultation with the major adviser (e.g., United States intellectual or European economic history). To fulfill the minimum requirement of 24 units, 4 units in disciplines other than history may be applied.

Concentration in the Area of American Civilization. The Department of History administers an interdisciplinary doctoral program in American civilization. Students are required to take, among their 16 units before preliminary examinations, at least 4 units in American history, 3 in literary studies, and 3 in either the social sciences or the history of art. Course work may be arranged to allow specialization in such interdisciplinary fields as popular culture, urban studies, regional studies, folklore, film, women's studies, and minority cultures. Students may earn a master's degree in American civilization by taking 8 units, including 3 in history, 2 in literature, and 2 in either the fine arts or the social sciences. At least 4 of these units must be at the 400 level, and one should represent an interdisciplinary research project. Students apply for admission and financial aid through the Department of History.

Concentration in the Area of History, Philosophy, and Sociology of Science. The Departments of History, Philosophy, and Sociology jointly offer—for work toward the AM and the PhD degrees—a special area of concentration in history, philosophy, and sociology of science. Students interested in this program enroll in and receive their degrees from either the history, the philosophy, or the sociology department, depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history, philosophy, or sociology is usually desirable, so also is a strong background in science, and students with such backgrounds, but only weak training in history, philosophy, or sociology will be considered for admission. The admission procedure is the same as that stated for each of the three departments, as is the information to be submitted with each application for admission. For students in this special concentration, the normal departmental requirements for the AM and PhD degrees are modified. Further information is available from the Department of History.

Financial Aid. Financial aid is almost always awarded on an academic-year basis. Applications are due in the department office by February 1. All fellowships and assistantships involve a stipend plus tuition and service fee waiver.

Fellowships. Available fellowships include University fellowships for entering AM students and for PhD students at the dissertation-writing stage; Babcock, Crawford, and Krueger Fellowships for dissertation-level students; Foreign Language and Area Studies (NDEA VI) Fellowships for those who have special interests in foreign area studies; and Graduate College fellowships for beginning students who have disadvantaged backgrounds.

Teaching Assistantships. Half-time teaching assistantships are the department's primary form of financial aid to graduate students admitted to the PhD program. Students who progress satisfactorily toward their degrees and demonstrate effective teaching will have their teaching assistantships renewed for a second and, in some cases, a third year.

Tuition and Service Fee Waivers. A number of tuition and service fee waivers are available each year both to entering and continuing students at the AM and PhD levels.

HISTORY, PHILOSOPHY, AND SOCIOLOGY OF SCIENCE

Graduate Degree Program. An interdisciplinary concentration in the history, philosophy, and sociology of science is available leading to the doctor of philosophy degree. Students for this program enroll in the Department of History, the Department of Philosophy, or the Department of Sociology. Further information may be obtained from those departments.

HORTICULTURE

Head of the Department: A.G. Endress
Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 1005 Plant Sciences Laboratory, 1201 South Dorner Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.C. Carbonneau, J.O. Dawson, A.G. Endress, W.L. George, J.M. Gerber, F.A. Giles, M.M. Meyer, C.A. Rebeiz, D.S. Seigler, R.M. Skirvin, W.E. Splittstoesser, L.A. Spomer, D.J. Williams
Associate Professors: T.W. Fermanian, J.A. Juvik, G.J. Kling, S.S. Korban, S.M. Ries, M.A.L. Smith, J.M. Swiader, D.J. Wehner
Assistant Professors: E.L. Kerbel, J.B. Masiunas, W.C. Sullivan

Graduate Degree Programs. The Department of Horticulture offers graduate work leading to the master of science and doctor of philosophy degrees. Students may specialize in any phase of horticulture (fruit and vegetable crops, ornamentals, and turf), including breeding and genetics, culture and production, weeds and their control, environmental physiology, biochemistry, developmental anatomy and morphology, tissue culture, or marketing. A well-balanced program may include courses in agronomy (crops and soils), plant biology, food science, genetics, statistics, entomology, plant pathology, chemistry, biochemistry, agricultural economics, and agricultural communications.

Admission. Applicants should have a bachelor's degree in horticulture or equivalent preparation in the plant sciences and must meet the Graduate College requirements for admission.

Master of Science. A candidate must complete a minimum of 8 units of graduate study with a grade-point average of at least 4.0 (A = 5.0); at least 4 units must be in the 400 series of courses. Thesis and nonthesis options are available; however, the thesis option is preferred and is required of all research assistants. Any request for the nonthesis option is considered on its individual merit by the graduate committee of the department.

Doctor of Philosophy. The candidate must complete a minimum of 8 units of course work beyond the master's degree and pass a preliminary examination. The candidate must also

complete 8 units of thesis research, submit an acceptable thesis, and defend it in an oral examination. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee.

Specialization in Genetics.* The Department of Horticulture offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Various support moneys available on a competitive basis include University fellowships, College of Agriculture fellowships, research and teaching assistantships, and waivers of tuition and service fees.

**A proposal to establish a specialization in genetics is pending campus approval.*

HUMAN RESOURCES AND FAMILY STUDIES

Acting Director of the School: Donald K. Layman

Correspondence and Information: Contact the Graduate Programs Coordinators in the Divisions of Consumer Sciences, Human Development and Family Studies, or Foods and Nutrition within the School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 274 Bevier Hall, 905 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L. Birch, B.P. Klein, D.K. Layman, F.M. Magrabi, L.B. O'Reilly, M. Raheel, S.B. Salamon

Associate Professors: B.H. Bagby, A.H. Beller, H.M. Buckley, K. Cloud, B.J. Cude, S.U. Douglas, N.J. Fisher, V.R. Fitzsimmons, J.L. Hafstrom, R. Hughes, R.W. Larson, M.A. Morganosky, B.J. Peterson, R.J. Reber, S.J. Schmidt, M.A. Sohn, C.M. Todd

Assistant Professors: M.S. Brewer, K.M. Chapman, S. Donovan, A.T. Ebata, K.F. Folk, D.L. Hentges, L.F. Kramer, B.A. McBride, M.A. Paynter, M. Perry-Jenkins, S.M. Potter, K.W. Singletary, M.M. Weigel, Y. Yang

Graduate Degree Programs. The School of Human Resources and Family Studies offers graduate work leading to the master of science, master of arts, and doctor of philosophy degrees. Degree programs are available in family and consumption economics, foods and nutrition, food service systems, general human resources and family studies, human development and family ecology, and textiles and apparel. Requirements for these are listed under the individual programs.

For the master's degree in human resources and family studies, all candidates must complete a minimum of 8 units (9 if a thesis is not submitted), of which at least 4 must be in human resources and family studies. Four of the total units, including at least 2 in human resources and family studies, must be in 400-level courses.

The minimum grade-point average for admission is 4.0 (A = 5.0). Additional requirements are listed under the individual programs.

INDIVIDUAL DEGREE PROGRAMS

Family and Consumption Economics. The family and consumption economics programs are interdisciplinary. Admission requirements include one course in principles of economics, one course in applied statistics, and one course in calculus. Major areas of faculty research include satisfaction related to levels and standards of living and quality of living for families and individuals, management of family resources, and human capital with emphasis on the education and employment of women.

Master of Science. The MS program requires 3 units from family and consumption economics, 1 unit each of macro- and microeconomic theory at the 400 level, and 1 unit of research methods.

Doctor of Philosophy. Requirements include (1) 5 units from family and consumption economics; 1 unit each of macro- and microeconomic theory with a grade of at least a B in each; 2 to 4 units at the 400 level from economics or economics and agricultural economics; 2 units of statistics; 1 unit of research methods; 8 units of thesis, Family and Consumption Economics 499; (2) two of the three stages completed in residence; and (3) one written examination in family economics and one in consumption economics.

Foods and Nutrition. Major areas of faculty research interest include human nutrition through the life cycle, nutritional aspects of exercise, nutrient metabolism, nutrition and disease interactions, nutrient composition of foods, food service systems, sensory and instrumental evaluation of food quality, food biochemistry, and food safety.

Admission. For admission to the MS program, candidates must have training in organic and inorganic chemistry, calculus, microbiology, and physiology, as well as undergraduate courses in both foods and nutrition. In the foods and nutrition emphasis, a course in quantitative analytical chemistry is an additional requirement for entrance. For the concentration in food service systems, introductory courses in accountancy, business administration, and economics are required. Deficiencies must be removed during the first year of graduate study. For admission to the PhD program, in addition to the prerequisites listed above for the master's degree, a candidate must have taken physics. GRE scores are required of all applicants, and international applicants must submit a score of at least 580 on the Test of English as a Foreign Language.

Master of Science. The MS degree has two areas of emphasis: foods and nutrition, and food service systems. For both emphases, a minimum of 8 units, of which at least 4 must be in foods and nutrition, must be completed. Four of the total units, including at least 2 in foods and nutrition, must be in 400-level courses. Thesis topics may be in foods, nutrition, or food service systems. Specific course work required for each area is given below. Additional courses may be taken in foods and nutrition or related areas. Graduate-level courses required in the foods and nutrition emphasis include biochemistry with laboratory, biochemical nutrition, experimental study of foods, and seminars in foods and nutrition. Required foods and nutrition graduate-level courses in the food service systems emphasis include the experimental study of food; quantity food purchasing, production, management and service; and food service systems. In addition, personnel management, business organization, and marketing courses at the graduate level are required.

For all emphases each master's degree candidate must complete a thesis and have a final oral examination and thesis defense.

Doctor of Philosophy. A total of 24 units of graduate work must be completed; at least 8 and no more than 12 units of thesis research may be applied to the requirements. If a candidate has a master's degree in foods and nutrition or a related area, a minimum of 16 units, including up to 12 units of thesis research, must be completed. Required courses include at least 3 units of foods and nutrition, of which at least 2 must be at the 400 level. Students must take seminars in foods, nutrition, or food service systems. Other courses are selected, in consultation with the adviser, on the basis of the student's background and interests. Courses may be chosen from foods and nutrition, food science, biological and chemical sciences, statistics, or other related areas. Thesis topics may be in foods or nutrition.

A written PhD preliminary examination should be completed by the end of the second year in the doctoral program for those entering with an MS degree and by the end of the third year for those with a BS degree. A final PhD thesis defense is required upon completion of the dissertation.

Financial Aid. Financial aid is awarded to graduate students on a competitive basis, with teaching and research assistantships, fellowships, and tuition and fee waivers being available.

General Human Resources and Family Studies. The master's program in general human resources and family studies allows the candidate to obtain greater breadth than is possible in one of the more specialized areas. Candidates are required to take a minimum of 4 units from prescribed courses in three of the five specialized fields in human resources and family studies.

Home Economics Education. The MS program in home economics education requires that candidates hold a valid teaching certificate for home economics or have successfully completed Illinois certification requirements and earn at least 8 units of graduate credit, of which 4 units are in human resources and family studies. Three of the 8 units must be at the 400 level, with at least 1 of these in human resources and family studies. Four $^1/_2$-unit courses are specified in educational psychology and educational policy studies. At least 2 units must be in home economics education. Advisers for students in this program are in the Division of Home Economics Education, College of Education. A thesis is recommended.

Human Development and Family Studies. The degree programs are interdisciplinary, focusing on individual development across the life span and on the family context in which development occurs. Major areas of faculty research in human development include childhood and adolescence; in family studies, emphases include family systems, the family in cross-cultural settings, and the relationship between the family and other institutions in society.

Admission. Admission into all programs is based on a combination of criteria. All applicants are required to submit Graduate Record Examination scores and have previous course work in an area of the behavioral or social sciences. A student without prior course work in human development, family studies, and advanced-level research methods and statistics may be admitted to a graduate program, but will be required to make up deficiencies during the first year of the program.

Master of Science or Master of Arts. For the MS or MA degree, the student may specialize in the study of either the family or human development. The program is designed to prepare students as practitioners in education and social service agencies, or as the first step toward the doctor of philosophy degree. Students must complete a minimum of 8 units, including 2 units of thesis, or 9 units if a thesis is not submitted; 4 of the total units must include HDFS 418 and 419 and two other 400-level courses.

Master of Science and Master of Social Work. A joint master's degree program offered in conjunction with the School of Social Work is designed to prepare students for careers as marital and family therapists within a human service agency, or as independent practitioners, teachers, or clinical researchers. For admission to the MS/MSW joint degree program, students must apply to both the Division of Human Development and Family Studies and the School of Social Work and must meet the standards for admission and be approved by both. Completion of the program meets the requirements for associate membership in the American Association for Marriage and Family Therapy. Students in the HDFS phase of the program take course work in family studies, human development, and family systems to fulfill the requirements for the MS. They then fulfill requirements for the MSW. Students who hold a BSW degree must complete a minimum of 20 units of course work to satisfy requirements for the MSW and MS degrees. Students with baccalaureate degrees in other disciplines may need to complete up to 22 units if they lack certain social work credits as undergraduates.

Doctor of Philosophy. The program is designed to prepare students to be researchers, educators, policy developers, or practitioners in human services delivery. Requirements for the PhD include 16 units beyond the MS or MA degree, a predissertation research paper, a preliminary written examination designed by the student's faculty committee, an examination of the dissertation prospectus, and a final oral defense of the dissertation. The student selects human development or family studies as the major area of concentration; the other division area serves as a minor area of concentration. A cognate area is selected from outside the division. Course work in areas such as anthropology, family economics, sociology, psychology, educational psychology, early childhood education, or social work, selected in consultation with the adviser, can satisfy program requirements within the area of specialization and in the cognate area. At least 2 units in advanced research methodology and/or statistics, HDFS 420, HDFS 421, and 8 units of thesis are required.

Textiles and Apparel. For the MS or MA degree in textiles and apparel, students may specialize in the study of industry, economics, international studies, the social psychology of dress, history of textile science, or textile and apparel marketing. Major areas of research include global marketing and international trade, cognitive and interpersonal factors influencing apparel

selection and perceptions of dress, consumer behavior, consumer values, labor and technology in the textile/apparel industries, performance evaluation of consumer textile products, protective clothing, and safety aspects of textiles.

Master of Science or Master of Arts. Admission requirements include a background in textiles, apparel, and associated courses. Deficiencies should be made up during the first year of graduate study. The graduate program must include a minimum of 8 units, or 9 units if a thesis is not submitted; at least 4 of the total units must be in textiles and apparel and 4 at the 400 level. Graduate-level statistics and research methods courses also are required. Additional courses are selected in accordance with the special interests of individual students.

Financial Aid. University fellowships and fellowships in the College of Agriculture and the School of Human Resources and Family Studies, tuition and service fee waivers, research assistantships, and teaching assistantships are available in several programs.

JOURNALISM

Head of the Department: Steven Helle
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: J. Carey, C. Christians, T. Littlewood
Associate Professors: W. Berry, S. Helle, J. Landay, C. Llerena-Aguirre, R. Reid, J. Thomas, C. Whitney

Graduate Degree Program. The Department of Journalism offers graduate work leading to the master of science degree. The department does not offer a PhD degree. For the program leading to the Doctor of Philosophy in Communications, see page 73.

Admission. Applicants must have a bachelor's degree from an accredited U.S. institution or one of recognized standing abroad. A grade-point average of 4.0 (A = 5.0) is the minimum requirement for admission to the Graduate College, with exceptions by petition only. Because the master's program has an enrollment ceiling, some applicants with grade-point averages of 4.0 or higher may not be admitted. It is imperative that all applicants supply writing samples, and applicants for the broadcast sequence should supply an audio cassette tape of themselves reading a news story. Letters of recommendation and the Graduate Record Examination are required. If possible, a personal interview with the head of the department or director of graduate studies is also helpful.

Master of Science. The following are requirements for the degree: (1) a major of 4 units or 3 units and 1 additional unit approved by the department; candidates without undergraduate work in journalism or equivalent professional experience are required to complete 1 unit of news editing (either news-editorial or broadcast news editing), 2 units in news writing, and 1 unit of either graphics and photojournalism or electronic news production; (2) a thesis, or preparation of a topic in journalistic form for publication or broadcast, for 1 unit; (3) a minimum of 3 units in courses at the 400 level, at least 2 of which must be in journalism; (4) a minimum total of 8 units with a grade-point average not lower than 3.875.

Financial Aid. See the description of the University fellowship and tuition and service fee waiver program in the introductory section of this catalog. Assistantships (teaching or research) are awarded on a quarter-time to half-time basis and carry a waiver of tuition and some fees. To be considered for financial aid, applications, including transcripts and three letters of recommendation, must be received no later than February 15. Students with journalism degrees or professional experience may become candidates for part-time positions in other units of the University that require journalistic skills in writing, editing, and/or photography and graphics.

KINESIOLOGY

Head of the Department: Karl M. Newell

Correspondence and Information: Director, Graduate Studies Program Office, Department of Kinesiology, University of Illinois at Urbana-Champaign, 113 Freer Hall, 906 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.J. Adrian, R.A. Boileau, S.L. Greendorfer, J.W. Loy, K.M. Newell, G.C. Roberts, R.G. Wright

Associate Professors: L.G. Carlton, E. McAuley, J.E. Misner, M. Slaughter, M. Trekell

Assistant Professors: G.W. Bell, H. Deutsch, L.L. Ji, S. Petrucello, G. Riccio, N.C. Rich, I.C. Rovegno, K. Rosengren, S. Slowikowski, R. Stillman

Graduate Degree Programs. The Department of Kinesiology offers graduate work leading to the degrees of Master of Science in the Teaching of Kinesiology, master of science, and doctor of philosophy. Major areas of specialization at both the master's degree and doctoral degree level include (1) the biodynamics of physical activity—the study of work output, energy, and efficiency of movement, undertaken to better understand the nature of exercise stress, the mechanics of human movement, and fitness throughout the human life span; (2) the social science of physical activity—the study of the antecedents and consequences of involvement in physical activity and sport, as well as the impact that physical activity and sport have upon individuals, society, and culture; (3) coordination, control, and skill—the study of the mechanisms and processes involved in the coordination, control, and skill of human physical activity. Areas of specialization at the master's level only also include pedagogical kinesiology (the study of the organizational and instructional concepts essential for the efficient and effective conduct of physical activity programs, particularly those that relate to physical education and sport contexts) and therapeutic kinesiology (the study of movement as a therapeutic vehicle for health and wellness, particularly the prevention and rehabilitation of injury or movement function).

Master of Science in the Teaching of Kinesiology. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, eligibility for teacher certification in Illinois, a minimal total score of 1,500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. This degree program is designed for individuals who wish to advance their teaching competencies. Candidates for this degree must complete a minimum of 8 units, 4 of which must be in kinesiology and 2 in education courses. Three of the total units must be in 400-level courses. Of the 4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. Information concerning the specific requirements of the 2 units in education may be obtained from the graduate studies office of the department. No more than 2 units of graduate study from another institution can be transferred. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A thesis is not required.

Master of Science. Admission to this degree program requires a baccalaureate degree from an accredited institution of higher education, a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, a minimal total score of 1,500 on the aptitude portions of the Graduate Record Examination, and three letters of recommendation. Candidates for this degree must complete a minimum of 8 units, 4 of which must be completed in kinesiology (excluding Kinesology 499). Each student must identify a major area of study from the following list: biodynamics; coordination, control, and skill; social science of physical activity; therapeutic kinesiology; pedagogical kinesiology. At least 2 units must come from the identified major area of study, and 1 unit must be taken from one additional area of study in the department. Of the total units, 3 must be earned in 400-level courses. Of the

4 units in kinesiology, Kinesiology 495 (Research Methods in Kinesiology) or an equivalent graduate-level research methods course appropriate to a student's program of study is required. No more than 2 units of graduate credit from another institution can be transferred. It is possible for a full-time student to complete this degree program in one academic year plus one summer session. A student may choose to write an acceptable thesis for 2 units of credit (i.e., Kinesiology 499) or select a nonthesis option by substituting 2 units of credit (i.e., approved credit that includes at least 1 unit of Kinesiology 493 [Independent Study]).

Doctor of Philosophy. Admission to this degree program requires a master's degree from an accredited institution of higher education, completion of a thesis or equivalent research experience, a minimum grade-point average of 4.5 (A = 5.0) for all graduate work, a minimal total score of 1,800 on aptitude portions of the Graduate Record Examination, and three letters of recommendation. Candidates must complete 16 units beyond the master's degree, including 2 units in other disciplines and 8 units of thesis research. Each student must choose a major area of study from the following: biodynamics; coordination, control, and skill; or the social science of physical activity. PhD candidates are required to demonstrate competence in research methodology appropriate to their area of study. They must also successfully complete the preliminary and final doctoral examinations.

Research Facilities. In support of its graduate programs and research efforts, the Department of Kinesiology maintains the Physical Fitness Research Laboratory and several research laboratory facilities in biomechanics, motor control, and sport psychology.

Financial Aid. A number of teaching assistantships are available in the department's instructional programs. A limited number of research assistantships are available to support the departmental research laboratories. Assistantships usually provide a stipend for services performed, as well as a tuition and partial fee waiver.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: W. Franke
Correspondence and Information: Staff Associate, Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: F.D. Blau, D. Day, F. Drasgow, G. Ferris, P. Feuille, W. Franke, P. Hartman, W. Hendricks, C. Hulin, L. Kahn, G. Oldham, R. Peters, S. Rosen, M. Rothbaum, K. Taira, H. Triandis
Associate Professors: P. Carnevale, H. Elkiss, J. Lawler
Assistant Professors: M. LeRoy, J. Martocchio, E. Perry, D. Schneider, P. Simpson
Emeritus Professors: W. Adelman, M. Derber, W. Form, B. Karsh, W. McPherson, M. Wagner, E. Wolfe

Graduate Degree Programs. The Institute of Labor and Industrial Relations (ILIR) offers graduate work leading to the master of arts and doctor of philosophy degrees. Students must meet the general admission requirements of the Graduate College, as well as the specific requirements of the institute.

Graduate study at the institute is based on a multidisciplinary approach to industrial relations problems and a flexible curriculum. To achieve this, the institute has joint faculty appointments and course listings with economics, history, psychology, sociology, and business administration; and joint course listings with law, political science, vocational education, and social work.

Master of Arts. The master's program can lead to a professional, terminal AM degree, or it can prepare students to continue their graduate study toward a PhD degree or doctoral degrees in law and other professional areas. The fields of concentration are unions, management, and labor relations policy; human resource management and organizational behavior; and labor markets and employment.

The institute offers a number of program options for the AM degree. All options require a minimum of 10 units of work and usually take three semesters to complete. All of the master's degree programs have core requirements in industrial relations systems, quantitative methods, and research methods.

Admission to the master's program is based on an applicant's undergraduate record, letters of reference, Graduate Record Examination scores, and statement of interest and goals. Usually, the minimum requirements for admission are a course in statistics and an average grade of B in the last 60 hours of undergraduate work. A deficiency in statistics may be made up by taking the required course without graduate credit during the first semester of graduate study.

Joint JD/AM. The joint degree program with the College of Law leads to the JD and the AM degrees in labor and industrial relations in three-and-one-half years. Students must apply to both the College of Law and the Institute of Labor and Industrial Relations and must be accepted by both units.

Doctor of Philosophy. The PhD program in labor and industrial relations is an interdisciplinary research degree. An individual program is built around the student's area of specialization. It includes industrial relations theory, research methodology, and course work both in a major social science discipline and in other professional and disciplinary subjects relevant to the interdisciplinary area of specialization. Examples of areas of specialization include government employer-employee relationships; labor in politics; economic effects of collective bargaining; discrimination in employment; wage policy issues in economic development; motivation, morale, and job satisfaction; international comparative industrial relations systems; behavior in union and management organizations; interorganizational relations; work design; pay systems; cross-cultural issues in industrial relations; and structural and technological determinants of human behavior. The PhD degree requires 24 units of credit beyond the baccalaureate degree, satisfactory completion of qualifying examinations in industrial relations theory and the area of specialization, and a thesis.

A student interested in earning a PhD degree after receiving a master's degree at the institute should indicate this fact on the application for admission. Students with outstanding undergraduate records or with a master's degree from another institution may apply for entrance directly to the doctoral program. The degree should be in labor and industrial relations or an allied field such as business administration, economics, history, sociology, political science, or psychology. The applicant should submit with the application evidence of research competence (master's thesis, term papers, an undergraduate thesis, special reports, or published articles). All papers will be returned.

Financial Aid. The institute offers research assistantships and fellowships to high-ranking graduate students and to new students whose undergraduate records are superior. A research assistant receives a salary plus exemption from tuition and some fees. The Graduate College also awards fellowships that carry stipends plus tuition and service fee waivers. Tuition and service fee waivers may also be granted but do not carry a stipend.

LANDSCAPE ARCHITECTURE

Head of the Department: V.J. Bellafiore
Coordinator of the Graduate Program: Douglas M. Johnston
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 214 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.R. Anderson, V.J. Bellafiore, T.G. Harkness, L.D. Hopkins, J.A. Jakle, R.B. Riley, E.S. Weidemann
Associate Professors: K.H. Anthony, D.M. Johnston, G.B. Kesler, B.A. Orland
Assistant Professors: C. Emmerling-DiNovo, M.G. Helgeson, J.F. Johnson, D.A. Kovacic, A. Sinha, C.D. Verson, J. Vining
Emeritus Professor: W.M. Keith

Graduate Degree Programs. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture degree. The program is designed to enable students to gain fresh insights and to experiment with new applications pertaining to land and its use by people. Courses and faculty research activities range from at-site to regional scales and include land resources planning and design, and behavioral and cultural factors in design. The scope of work may include ecological and behavioral assessment, human perception, and comprehensive computer-based methods. Before submitting an application, students should obtain a departmental pamphlet that describes the specific areas of study and the time needed to complete the requirements.

Several faculty members in the department are also faculty members in the Regional Planning PhD program administered by the Department of Urban and Regional Planning. See the program description under the Department of Urban and Regional Planning for more information.

Admission. The Graduate College admission requirements apply, except that higher TOEFL scores are required for international students. Students are admitted on an individual basis according to a review of their prior accomplishments with an emphasis on academic achievement. Candidates from undergraduate design programs must submit samples of their design work with their applications. Candidates without undergraduate preparation in landscape architecture will be admitted on limited status and must complete undergraduate prerequisite courses in addition to graduate work.

Master of Landscape Architecture. A student must complete a minimum of 12 units, with at least 6 units taken within the department and at least 3 units of electives chosen from courses offered outside the department. At least $4^{1}/_{2}$ units must be taken in 400-level courses. Specific courses to be taken are determined in consultation with an adviser. These courses culminate in a master's thesis (Landscape Architecture 499) that permits the student, under the approval and supervision of a faculty committee, to pursue independently an in-depth work of particular relevance for landscape architecture.

Financial Aid. Students compete for fellowships, tuition and service fee waivers, and assistantships. Selection is based on the academic achievement and qualifications of the student.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center: Enrique Mayer

Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana-Champaign, 201 International Studies Building, 910 South Fifth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: W. Baer, W. Blaylock, F. Boyle, C. Deal, E. Garfield, D. Grove, S. Lo, J. Love, E. Mayer, T. Meehan, M. Palencia-Roth, R. Reisner, I. Schulman, J. Thompson, J. van Es, N. Whitten, R. Zuidema

Associate Professors: A. Aiex, C. Augspurger, P. Borgeson, S. Brown, D. Coes, P. Garber, N. Gonzalez, E. McClure, L. Reynolds, M. Solaun, W. VanPatten, J. Warfield, J. Wilcox

Assistant Professors: P. Cardenas, L. Delgado, V. Diaz-Balsera, A. Escobar, R. Garcia, D. Grynspan, J. Hualde, N. Jacobsen, J. Lee, W. Maloney, A. Metz, G. Munck, P. Sharpe, H. Silverman, J. Tolliver, T. Turino, M. van de Guchte, M. Weigel

Graduate Degree Programs. Graduate minors in Latin American and Caribbean studies are administered by the director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin American and Caribbean studies must complete 2 units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete 4 units for one minor or 2 units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center. A combined graduate program in agricultural economics and foreign area studies (in this case, Latin American studies) is also available.

Students in technical and professional colleges and schools of the University of Illinois at Urbana-Champaign who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the director of the center or with their advisers in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American and Caribbean area for government, private business, publishing, or religious organizations.

A high level of proficiency in one or more languages of the region (Spanish, Portuguese, and Indian languages) is required. For course information, requirements, and methods used to establish the level of proficiency, contact the student adviser or center director.

Language Instruction. The center offers Quechua, the native language spoken by 13 million people in the Andean republics.

Financial Aid. The center is a recipient of Federal Government Title VI Foreign Language and Area Studies (FLAS) Fellowships for Graduate Studies in any discipline that includes a minor in Latin American studies and an intensive program of language instruction. Summer fellowships for intensive language courses abroad or in the United States are available. Small travel grants for graduate students wishing to do research during the summer are also available on a competitive basis. Both of these programs depend on outside funding and thus cannot be guaranteed in any given year.

LAW

Dean of the College: Richard Schmalbeck
Director of Graduate and International Legal Studies: L. Reynolds
Correspondence and Information: Office of Graduate and International Legal Studies, University of Illinois at Urbana-Champaign, 105 Law Building, 504 East Pennsylvania Avenue, Champaign, IL 61820

GRADUATE FACULTY

Professors: F.A. Boyle, G. Bradley, W.J. Davey, D.A. Dripps, M.W. Finkin, E.T. Freyfogle, O.F. Harris, S.L. Harris, P. Hay, R.L. Kaplan, K. Kinsport, H.D. Krause, W.R. LaFave, P.B. Maggs, J.H. McCord, T.M. Mengler, D.J. Merritt, J.E. Nowak, R. Reisner, L.A. Reynolds, S.F. Ross, R.D. Rotunda, E.W. Shoben, V.J. Stone, C.J. Tabb, T.S. Ulen
Associate Professors: C.T. Terry
Assistant Professors: S.M. Bainbridge, J.D. Colombo, J.E. Pfander, A.D. Taibi
Emeritus Professors: J.E. Cribbet, G.T. Frampton, V.J. Stone

Programs of Graduate Study. Programs of graduate study in law are designed for law graduates who wish to pursue advanced study and conduct independent research under the direction of the College of Law faculty. Three advanced degrees are conferred by the College of Law: the degree of Master of Comparative Law (MCL), the degree of Master of Laws (LLM), and the degree of Doctor of the Science of Law (SJD). Because each of these degrees differs substantially from the others in terms of purpose and curricular requirements, admission is specific for a particular degree program. Overall coordination of the graduate program is the responsibility of the director of the Office of Graduate and International Studies, and individual inquiries should be addressed to this office.

Master of Comparative Law (MCL). The degree of Master of Comparative Law is designed primarily for foreign lawyers or law teachers who wish to increase their knowledge of the Anglo-American common law system and engage in comparative legal research.

Candidates for the MCL must complete a minimum of 8 units of study in law. These 8 units must consist of 6 units of course work to be selected from among the curricula offered (excluding 399 credit). In addition, all MCL students must enroll in the course Introduction to the U.S. Legal System, which carries 2 units of credit.

Master of Laws (LLM). The Master of Laws (LLM) degree is open to both graduates of U.S. law schools and, under certain conditions, to applicants whose prior law study was taken in a non-common law jurisdiction (including those adhering to the civil law).

Applicants who have completed a course of basic law study in a civil law jurisdiction are eligible for admission to the LLM degree program if they have scored 600 or above on the TOEFL examination before beginning their graduate studies. Applicants who score below 600 on the TOEFL may be admitted into the LLM program only upon petition at the end of the first semester of study. Admission will be granted if the applicant has demonstrated a superior capacity for law study as evidenced by his or her academic performance in the course taken in the first semester (e.g., a minimum of 4.0 GPA).

Degree Requirements. (a) Candidates whose prior legal study was in a U.S. or other common law jurisdiction must satisfactorily complete 4 units of regular course work and 4 units of thesis research leading to a dissertation. Such courses must be elected from among the courses and seminars offered in the second- or third-year curriculum (see Description of Courses in the College of Law catalog). However, 399 or 499 research credit may not be counted toward the fulfillment of their 4-unit course requirement. Upon petition, one law-related course offered by other University departments may be counted as credit toward the LLM degree.

In addition to the four units of regular course work, candidates for the LLM degree whose prior legal study was in a common law jurisdiction must complete a dissertation of acceptable quality.

(b) Candidates whose prior legal study was in a civil or other non-common law jurisdiction must complete a total of 8 units of course work. In addition to the course Introduction to the

U.S. Legal System (which will satisfy one unit of credit), candidates for the LLM degree must complete seven units of regular course work selected from any courses in the curriculum excluding 399 independent research or 499 dissertation research.

Doctor of the Science of Law (SJD). No applicant will be admitted to SJD candidacy until he or she has completed at least two semesters of graduate study in law at the University of Illinois at the master's level. The decision to admit will be based on the truly outstanding level of the applicant's performance in courses taken during the period in residence as well as his or her demonstrated ability for independent research and writing as evidenced by the authorship of at least one article appearing in a U.S. legal periodical.

The requirements for the SJD degree consist of the preparation of a dissertation of publishable quality and a program of study prescribed by the Committee on Graduate and International Legal Studies. This program of study includes, as an essential element, research and writing under faculty supervision in areas related to the candidates SJD thesis. In addition, candidates will generally be required to take those courses and seminars from among the College of Law course offerings that relate to the candidate's dissertation topic. After submission of the dissertation, the candidate must pass an oral examination in defense of the dissertation before a doctoral committee of the faculty specifically convened for that purpose.

Financial Aid. The College of Law offers six instructorships to students whose backgrounds have been in the Anglo-American common law system and several research assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition are available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by February 1.

LEISURE STUDIES

Head of the Department: William R. McKinney
Correspondence and Information: William R. McKinney, Head, Department of Leisure Studies, University of Illinois at Urbana-Champaign, 104 Huff Hall, 1206 South Fourth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.J. Burdge, J.R. Kelly, G.C. Roberts
Associate Professors: D.J. Brademas, G.E. Chick, R.D. Espeseth, D.R. Fesenmaier, W.R. McKinney, L. Barnett Morris
Assistant Professors: J.D. Burnam, L. Valerius, J.E. Voelkl, B.E. Wicks
Emeritus Professors: J.J. Bannon, A.V. Sapora

Graduate Degree Programs. The Department of Leisure Studies offers a program of study leading to the master of science and the doctor of philosophy degrees. The master of science program educates students about leisure behavior, public parks and recreation systems, treatment centers for the ill and disabled, and various private and semipublic settings providing leisure services. The MS degree may also serve as the first step toward the PhD program. The PhD program is, in general, designed to develop educators and research personnel in the study of leisure behavior, the management of systems that provide leisure services, or both.

Admission. The Graduate College admission requirements apply. Specifically, the admission requirements are a minimum grade-point average of 4.0 (A = 5.0) for the last 60 hours of undergraduate work and any graduate work completed, and satisfactory verbal, quantitative, and analytical Graduate Record Examination scores. Preference is given to applicants who will be full-time students and active degree candidates.

Master of Science. A candidate for the MS degree must spend at least one semester on campus and complete a minimum of 8 units, 3 of which must be in the 400 series and 2 of the 3 in leisure

studies; 4 of these units should be in the student's area of specialization. A professional paper may be submitted in addition to course work, or a thesis may be written for 2 units of credit. A full-time student can complete the program in three or four semesters.

Doctor of Philosophy. A candidate for the PhD degree must spend at least two years in residence and satisfactorily complete a minimum of 16 units beyond the master's degree. These units include the credit for the PhD thesis. Departmental requirements include satisfactory performance on the doctoral qualifying examination, the written preliminary examination at the completion of formal course work, the oral preliminary examination on the proposed research for the thesis, and a final examination in defense of the doctoral thesis.

Financial Aid. The department offers quarter-time and half-time assistantships in both teaching and research, as well as tuition and fee waivers and the opportunity to apply for fellowships.

LIBRARY AND INFORMATION SCIENCE

Dean of the Graduate School of Library and Information Science: Leigh S. Estabrook
Correspondence and Information: Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, 410 David Kinley Hall, 1407 West Gregory Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: M. Brichford, M.T. Choldin, C.H. Davis, L. Estabrook, K.L. Henderson, D.W. Krummel, F.W. Lancaster, S. Richardson, M. Williams
Associate Professors: L. Smith, P. Stenstrom, T.L. Weech
Assistant Professors: B. Allen, J.B. Sutton
Lecturers: A. Bishop, G.B. Newby

Graduate Degree Programs. The Graduate School of Library and Information Science offers programs of study leading to the master of science, the certificate of advanced study, and the doctor of philosophy degrees. The master of science degree program prepares men and women for professional careers in all types of libraries and information centers. The certificate of advanced study program provides the opportunity (1) to study an aspect of library and information science in greater depth than is possible in the master of science program, (2) to refresh and upgrade one's professional training several years after the master of science program or (3) to redirect one's career into a different area of library and information science. The doctor of philosophy is a research degree program.

Admission. The general admission requirements of the Graduate College apply. Consideration is also given to language study, relevant work experience, letters of reference, Graduate Record Examination aptitude test scores, and evidence of leadership. International students must score at least 600 on the Test of English as a Foreign Language. The certificate of advanced study and doctor of philosophy programs require a master's degree in librarianship from a library school with an A.L.A.-accredited program and a grade-point average of at least 4.0 (A = 5.0) in the master's program. For the doctor of philosophy program, two years of library work experience at the professional level and an interview with the school's advanced studies committee are also required.

Master of Science. The MS degree requires of all students 10 units of graduate study, including 1 unit of Library and Information Science 300, 1/2 unit of Library and Information Science 307, and 1/2 unit of Library and Information Science 320. Possible areas of specialization include all main types of libraries (e.g., academic, public, school, and special), all main types of work in libraries (e.g., cataloging, reference, and children's services), plus other concentrations such as information science, library automation, rare books, and archives. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A thesis is not required but is available as an option. A minimum of twelve months is required to complete the master's program.

Certificate of Advanced Study (CAS). The certificate is awarded upon the successful completion of 10 units of graduate course work beyond the master's degree. Of the 10 units, at least 6, including Library and Information Science 459 (CAS Project), must be in library and information science. Students and advisers work closely together in selecting appropriate courses of study to meet individual needs. A minimum of twelve months is required to complete the CAS program.

Doctor of Philosophy. The program consists of three stages: (1) generalization (9 units of course work required of all doctoral students), (2) specialization (3 or more units of elective course work plus a research tool), and (3) thesis (8 or more units). Thus, a minimum of 12 units of graduate course work plus 8 units of thesis credit are required. A minimum of two years is required to complete the necessary course work; an additional year or more, preferably in residence, is required for the thesis. A 4.5 GPA is the minimum for the four required seminars.

Research Interests, Facilities, and Resources. Major areas of faculty research interest include bibliography, cataloging and classification, information storage and retrieval, library automation, nonprint media, library services for children and young adults, and reference tools and services. The school's Library Research Center engages in applied and pure research on contract; staff members of the Library Research Center are available to students and faculty for consultation and guidance. A minicomputer network and CD-ROM system are integral to teaching and learning activities. The University of Illinois Library provides a vast reservoir of resources for all types of study and research in library and information science.

The school maintains an ongoing commitment to continuing education through conferences, institutes, workshops, and special course offerings. Of particular note are the annual Allerton institutes and clinics on library applications of data processing. An extensive publications program includes the annual *Proceedings* of each of these, plus *Library Trends*, *Occasional Papers*, and a variety of monographs.

Financial Aid. Financial aid may be available from the school, the University of Illinois Library, area libraries, and the like, in the form of graduate assistantships, preprofessional positions, and hourly paid work. Also, the school has a limited number of fellowships and tuition waivers for which doctoral students tend to be favored over CAS and master's students.

LIFE SCIENCES

(Including Biology; Cell and Structural Biology; Ecology, Ethology, and Evolution; Entomology; Microbiology; Neuroscience; Physiology and Biophysics; Plant Biology)

Director of the School: Jordan Konisky
Director of Biology Programs: S. Friedman
Correspondence and Information: Biology Programs, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

Graduate Degree Programs. Described in detail on the following pages are study programs leading to graduate degrees in cell and structural biology; ecology, ethology, and evolution; entomology; microbiology; neuroscience; physiology and biophysics; and plant biology. Biology programs, including the MS in Biology, the MS in the Teaching of Biological Sciences and General Sciences, and the PhD in Biology, specializing in Physiological and Molecular Plant Biology, are administered within the school and are described below.

Admission. To be considered for any program, an applicant must have an overall grade-point average of 4.0 (A = 5.0), must include a brief statement of educational objectives with the formal application, and must submit three letters of recommendation. GRE scores are mandatory for consideration for the PhD, but are not required for MS degrees.

Master of Science in Biology. This program is intended for students who wish to increase their knowledge of biology and become involved with graduate-level research in biology without the long-term commitment of a PhD program. The work plan is personally designed by each

student in consultation with an appropriate adviser. Breadth of training is encouraged. (For those wishing to concentrate their efforts, MS programs are available in most of the departments in the School of Life Sciences.) The degree requires 8 units of course work, of which 3 units must be in 400-level courses. Active status in the program is maintained through registration in two 300- or 400-level biology courses per semester and a grade-point average of at least 4.0 (A = 5.0). A research report is required of all candidates for the degree. Before the degree will be granted, the student must also complete or show college credit for the following: one year of physics with laboratory, a course in organic chemistry with laboratory, and a semester of calculus.

Master of Science in the Teaching of Biological Sciences and General Science. This program is designed for graduates in a biological discipline who intend to enter the teaching profession and for individuals already teaching biology or general science in junior high school, high school, or community college. The degree is awarded upon completion of a minimum of 8 units of course credit and proof of state teacher certification. Course work consists of 4 units in biological sciences, 2 units in education (see page 80) and 2 elective units. Electives are usually taken in biological sciences, education, or both.

Doctor of Philosophy in Biology. The School of Life Sciences offers a degree leading to a PhD in Biology, specializing in Physiological and Molecular Plant Biology. This is an interdisciplinary program staffed by plant biologists from seven departments in the College of Agriculture and the College of Liberal Arts and Sciences: agronomy, biochemistry, forestry, horticulture, physiology and biophysics, plant biology, and plant pathology. Thesis research can be conducted in any of a broad range of areas, which are organized into three alternative tracks of study: (1) organismal and community plant physiology, (2) plant biochemistry and biophysics, and (3) plant development and molecular biology.

Financial Aid. Support for graduate training is available in the form of teaching or research assistantships, traineeships, and University fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department or, for biology programs, from the School of Life Sciences.

Cell and Structural Biology

Head of the Department: A.F. Horwitz
Correspondence and Information: Department of Cell and Structural Biology, University of Illinois at Urbana-Champaign, 506 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.T. Greenough, A.F. Horwitz, B. Katzenellenbogen, B. Kemper, D.A. Lauffenburger, C.C.C. O'Morchoe, P.J. O'Morchoe, D.M. Steffensen
Associate Professors: J.A. Cameron, W.L. Daniel, M.U. Gillette, S.J. Kaufman, A. Kokko-Cunningham, S. Lazarowitz, J.E. Mittenthal, J.A. Weyhenmeyer
Assistant Professors: A. Belmont, R. Blackman, D.F. Clayton, C. Doe, J.J. Henry, T.L. Karr

Graduate Degree Program. The Department of Cell and Structural Biology administers a graduate degree program as an option in biology. Departmental faculty are concerned with the structural and functional relationships of cells and organisms, with research emphases upon animal cell and molecular biology, neurobiology, structural biology, and developmental biology.

Admission. Applications are evaluated on an individual basis. The formal entrance requirement is a minimum grade-point average of 4.0 (A = 5.0). Important factors in the evaluation of applications are general academic performance, background in the biological and chemical

sciences and mathematics, Graduate Record Examination scores, and letters of recommendation from college professors. Although applications from qualified students are considered throughout the year, the deadline for submission of applications for fall semester is February 15.

Doctor of Philosophy in Biology: Cell and Structural Biology Area of Specialization. The program leads to the doctor of philosophy degree. In order to complete successfully the graduate program in cell and structural biology, the student must fulfill requirements in the following categories: course work, a qualifying examination, a preliminary examination, defense of the thesis, teaching, and departmental seminars. A brochure providing additional information about the program is available upon request.

Specialization in Genetics.* The Department of Cell and Structural Biology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Financial aid is available to a limited number of qualified applicants in the form of (1) University fellowships and tuition and fee waivers, awarded on a competitive basis; (2) teaching assistantships awarded by the department; and (3) research assistantships allotted by individual faculty members with research funds available for this purpose. Exceptional students will qualify for support from the Cell and Molecular Biology Training Program. Financial packages can be assembled from two or more of the above sources for qualified candidates.

**A proposal to establish a specialization in genetics is pending campus approval.*

Ecology, Ethology, and Evolution

Head of the Department: L.L. Getz

Correspondence and Information: Department of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign, 515 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.O. Batzli, M.R. Berenbaum, R.W. Burkhardt, T.H. Frazzetta, L.L. Getz, A.W. Ghent, E.E. Herricks, J. Hirsch, L.M. Page, D.P. Philipp, S.L. Portnoy, G.S. Whitt, C.R. Woese.

Associate Professors: C.K. Augspurger, S.H. Berlocher, E.H. Brown, Jr., G.H. Kieffer, R.P. Larkin, S.K. Robinson, D.C. Sweeney, T. Uzzell

Assistant Professors: J.K. Conner, E.H. DeLucia, K.N. Paige, G.E. Robinson, D.H. Wahl

Graduate Degree Programs. The Department of Ecology, Ethology, and Evolution administers graduate degree programs as options in biology. Areas of training include physiological, population, community, and evolutionary ecology; ethology, physiological mechanisms of behavior, and behavior genetics; evolutionary biology, population genetics, karyotypic and molecular analysis, functional anatomy, and systematics; quantitative analysis of genetic and ecological systems; and resource management.

Admission. Acceptance for graduate study in ecology, ethology, and evolution is based on the applicant's research potential and academic achievement. An undergraduate degree in the life sciences is the usual preparation, but students majoring in mathematics, computer science, or the physical and social sciences are also considered. Courses required for admission are inorganic and organic chemistry, biochemistry, a year of physics, and mathematics through

calculus. Students lacking one or more of these courses may be admitted with the provision that such deficiencies be completed in addition to the normal graduate course load. A grade-point average of at least 4.0 (A = 5.0) for the last 60 hours of undergraduate work and for any graduate study is mandatory, and good scores on the Graduate Record Examination are necessary. Considerable emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. With approval of the MS biology committee, students in ecology, ethology, and evolution may pursue an MS degree in biology under the supervision of a departmental adviser (see Master of Science in Biology, page 115).

Doctor of Philosophy in Biology: Ecology, Ethology, and Evolution Area of Specialization. Candidates for the PhD degree must demonstrate excellence by examination and, in consultation with an adviser and doctoral committee, plan and carry out original thesis research with distinction. A preliminary examination evaluating the ability of students to integrate subject matter related to their field is given during the third year. Courses in both statistics and computer science are required, and proficiency in one or more foreign languages may be required, depending on the field of research. Additional requirements may be prescribed by the adviser and doctoral committee. A final examination, in which the student defends the thesis, and a presentation of the thesis at a departmental seminar complete the program.

Specialization in Genetics.* The Department of Ecology, Ethology, and Evolution offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

**A proposal to establish a specialization in genetics is pending campus approval.*

Entomology

Head of the Department: Stanley Friedman
Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.J. Armbrust, M.R. Berenbaum, S. Friedman, A.W. Ghent, W.R. Horsfall, M.E. Irwin, W. E. LaBerge, J. V. Maddox, R. L. Metcalf, W. G. Ruesink, D. S. Seigler, J. G. Sternburg, G.P. Waldbauer
Associate Professors: J.E. Appleby, S.H. Berlocher, F. Delcomyn, A.S. Felsot, G.L. Godfrey, M. R. Jeffords, E. Levine, E. G. MacLeod, R. J. Novak, D. W. Onstad, K. L. Steffey, D. W. Webb, R.A. Weinzierl
Assistant Professors: C. E. Eastman, S. E. Fahrbach, M. E. Gray, H. M. Robertson, G. E. Robinson, D.J. Voegtlin, C. R. Vossbrinck

Graduate Degree Programs. The Department of Entomology offers graduate work leading to the master of science and doctor of philosophy degrees.

Admission. Graduate College admission requirements apply. Previous training in entomology is unnecessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Master of Science. A candidate for the MS degree is expected to become knowledgeable in entomology through courses and fieldwork and to complete a research thesis in an area of interest chosen in consultation with an adviser. The grade-point average required for degree certification is 4.0 (A = 5.0).

Doctor of Philosophy. A candidate for the PhD degree should be conversant with the following general areas of entomology: control, ecology, genetics, morphology, physiology, and taxonomy. The candidate must demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research is also required. The grade-point average necessary for degree certification is 4.0.

Financial Aid. Graduate student awards are available, including teaching and research assistantships. In addition, various types of fellowships, traineeships, and tuition and service fee waivers are offered by the Graduate College and the School of Life Sciences. A single application to the department is sufficient for consideration for all awards currently available.

Specialization in Genetics.* The Department of Entomology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

**A proposal to establish a specialization in genetics is pending campus approval.*

Microbiology

Head of the Department: Charles G. Miller
Correspondence and Information: Department of Microbiology, University of Illinois at Urbana-Champaign, 131 Burrill Hall, 407 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.P. Bryant, J.E. Cronan, S.K. Farrand, J.F. Gardner, J. Konisky, C.G. Miller, M.J. Plewa, M.E. Reichmann, A.A. Salyers, R.W. Tuveson, E.W. Voss, C.R. Woese, R.S. Wolfe
Associate Professors: S.G. Lazarowitz, S.R. Maloy
Assistant Professors: V.A. Bankaitis, D.W. Celander, G.J. Olsen, D.A. Stahl

Graduate Degree Programs. The Department of Microbiology offers graduate work leading to the master of science and doctor of philosophy degrees. For both degrees, the program provides a strong basic background in microbiology, biochemistry, cell biology, molecular genetics, and molecular biology. Students completing the program are qualified for positions in academic, industrial, or government laboratories and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Major areas of research interest are gene expression and regulation in prokaryotes and eukaryotes, viral function and development including virus host-cell interactions, membrane biogenesis including protein insertion, fatty acid and phospholipid synthesis, bacterial pathogenesis and bacterial-host interactions, immunoglobulin chemistry, structure and expression, anaerobic microbiology, the biochemistry of methane formation and microbial physiology, structure and function of RNA, yeast cell and molecular biology, prokaryote phylogeny and evolution, and archaebacteria.

Admission. Students electing microbiology as a major for an advanced degree should have had a total of at least 15 credit hours of physical or biological sciences, including general biology or microbiology, chemistry through organic chemistry and biochemistry, and mathematics through calculus.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees, following their choice of a faculty mentor. Study programs are flexible and are dependent upon the experience, interests, and goals of each student. Experience in teaching is considered to be a vital part of the graduate program and is required as part of the academic work of all PhD degree candidates.

Specialization in Genetics.* The Department of Microbiology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

**A proposal to establish a specialization in genetics is pending campus approval.*

Neuroscience Program

Program Chair: Bruce C. Wheeler

Correspondence and Information: Neuroscience Program, School of Life Sciences, University of Illinois at Urbana-Champaign, 393 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801; telephone: 217-333-8208

GRADUATE FACULTY

Professors: L. Barr, M.G.H. Coles, E. Donchin, T.G. Ebrey, A.S. Feng, M. Gabriel, R. Gillette, W.T. Greenough, J.E. Heath, J. Hirsch, A.F. Horwitz, G.L. Jackson, E.G. Jakobsson, K.W. Kelley, P.C. Lauterbur, R.L. Magin, J.G. Malpeli, G.W. Ordal, A.J. Parker, V.D. Ramirez, E. Satinoff, K.J. Schulten

Associate Professors: M.T. Banich, P.M. Best, M.J. Dawson, F. Delcomyn, J. Gergen, M.U. Gillette, M.A. Holzwarth, G.A. Iwamoto, J.M. Juraska, E. Meisami, G.A. Miller, J.E. Mittenthal, B. Oakley II, E.J. Roy, T.G. Waldrop, J.A. Weyhenmeyer, B.C. Wheeler, H.E. Whiteley, J.F. Zachary

Assistant Professors: L.C. Abbott, K.A. Akins, T.J. Anastasio, D.F. Clayton, N.J. Cohen, C.Q. Doe, S.E. Fahrbach, W. Heller, T.L. Karr, R.J. Mandel, M.E. Nelson, G.E. Robinson, S.L. Schantz

Professor Emeritus: C.L. Prosser

Graduate Degree Program. The Neuroscience Program, an interdisciplinary, interdepartmental program administered through the School of Life Sciences, is designed to provide individualized training in preparation for research and teaching careers in neuroscience. The program offers a PhD degree in Neuroscience. The goal of the program is to produce scientists who are both technically competent and broadly educated in neuroscience. A joint MD/PhD degree is also offered in conjunction with the College of Medicine (see page 130). Areas of concentration include: neuroanatomy; neurophysiology; cognitive and behavioral neuroscience; neurochemistry, neuropharmacology, and neurotoxicology; neuroendocrinology and neuroimmunology; developmental, genetic, and molecular neuroscience; clinical and biomedical neuroscience; and computational neuroscience.

Admission. Specific courses are not required for admission. However, it is recommended that applicants have courses in general biology, chemistry, physics, mathematics through calculus, and in the specific areas of concentration representing their interests. Graduate record examination scores or MCAT scores are required. School of Life Sciences and Graduate College admission requirements also apply.

Doctoral Degree Program. Because of the breadth of the fields in this program, the course work is tailored to the student's fields of interest as declared by a major and at least two minor areas of concentration from among those listed above. A faculty committee of representatives from

the major and minor areas will then meet regularly with the student to plan course work and research experience. The goal of this plan is to allow maximal flexibility while providing students with close guidance. Courses and laboratory research experience are supplemented by weekly seminars in neurobiology.

Financial Aid. Financial aid for graduate students in neuroscience is available in the form of fellowships, teaching and research assistantships, and traineeships. Qualified candidates are considered for financial support upon application. Graduate students making satisfactory progress toward their degree generally continue to receive support until they complete their graduate studies.

Physiology and Biophysics

Head of the Department: A.S. Feng
Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, 407 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.M. Bahr, L. Barr, D.E. Buetow, A.R. Crofts, P.B. Debrunner, A.L. DeVries, E. Donchin, H.S. Ducoff, F. Dunn, T.G. Ebrey, A.S. Feng, H. Frauenfelder, R.B. Gennis, R. Gillette, Govindjee, E. Gratton, W.T. Greenough, J.E. Heath, S.I. Helman, G.L. Jackson, E. Jakobsson, B.S. Katzenellenbogen, B.W. Kemper, P.C. Lauterbur, R.L. Magin, R.A. Nelson, C.L. Prosser, V.D. Ramirez, E. Satinoff, K.J. Schulten, O.D. Sherwood, I.A. Siegel, W.W. Sleator, S.G. Sligar, A.R. Twardock, A.H.-J. Wang, G. Weber, P.G. Wolynes, C.A. Wraight
Associate Professors: P.M. Best, M.J. Dawson, F. Delcomyn, M.U. Gillette, M. Holzwarth, G.A. Iwamoto, A. Kokko-Cunningham, E. Meisami, B. Oakley, E.J. Roy, D.C. Sweeney, T.G. Waldrop, J. Wand, J.A. Whitmarsh
Assistant Professors: T.J. Anastasio, A.S. Belmont, M.E. Nelson, S. Subramanian

PHYSIOLOGY

Admission and Financial Aid. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a strong undergraduate training in science. The Graduate College admission requirements apply. To be admitted, students should have a grade-point average between an A and a B and letters of recommendation that indicate ability to perform graduate work. Applicants are strongly urged to submit scores of the Graduate Record Examination or similar examinations. Fellowships and teaching or research assistantships are available for qualified students.

Master of Science. A master's degree requires 8 or more units of graduate work drawn from the offerings of this and other departments. Each student must submit, and pass an oral examination on it. The examination is conducted by a faculty qualifying committee.

Doctor of Philosophy. Every candidate for the PhD degree is required to take three core lecture courses and four laboratory courses, the latter of five weeks duration each, in order to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology. Each student is also expected to acquire a high degree of expertise in an area of specialization and to develop proficiency in biochemistry, physical chemistry, and statistics. The student should begin research as soon as possible after admission. To continue in the PhD program, students must submit a report describing their initial research and pass an oral examination. The examination is conducted by a faculty qualifying committee, usually during the fourth semester after admission to the graduate program.

Students take the preliminary examination after completing at least 16 units of graduate course work and all courses specified by the advisory committee. The final examination consists of a thesis based on original work, demonstrating a thorough knowledge of theory and techniques in one of the branches of physiology.

Specialization in Genetics.* The Department of Physiology and Biophysics offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

**A proposal to establish a specialization in genetics is pending campus approval.*

BIOPHYSICS

Admission and Financial Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical sciences to the solution of biological problems. The curriculum is broadly based and provides an adaptable approach for students entering with previous training in the physical sciences or for students with a background in biology and some experience in the physical sciences. Admission requirements are usually one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through calculus, but deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0 (A = 5.0). Fellowship, traineeships, and teaching or research assistantships are available for qualified students. Usually, students are expected to obtain at least one semester of teaching experience during their graduate careers.

Master of Science. To obtain the master of science degree, the student must complete at least 8 units in biophysics and related subjects, including 3 units at the 400 level (excluding seminars and research). A thesis or research paper in a specialized field is also required.

Doctor of Philosophy. The program has a flexible approach toward curriculum requirements, but an acceptable course program usually includes the following: (1) physical sciences: mathematics through differential equations, physics or physical chemistry including thermodynamics and elementary quantum mechanics, and biochemistry. (2) biophysics: satisfactory completion of $3^1/_2$ units of 400-level biophysics courses (excluding seminars and research) and other subjects with the approval of faculty; (3) research experience as soon as practicable after admission. The PhD degree is a research degree, and the program is designed with a major emphasis on individual research.

A pass-fail qualifying examination is usually taken during or before the fourth semester. After the student has formulated a definite research problem, he or she takes the preliminary examination in which the student presents his or her topic to a faculty committee. The committee will also question the candidate on his or her general research area. Finally, a thesis, which is based on original work and which demonstrates a thorough knowledge of theory and techniques in one of the areas of biophysics, must be defended at the final examination.

Plant Biology

Head of the Department: David S. Seigler
Correspondence and Information: Associate Head, Department of Plant Biology, University of Illinois at Urbana-Champaign, 265 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: M.R. Berenbaum, D.E. Buetow, R.E. Crang, Govindjee, L.R. Hoffman, W.L. Ogren, D.R. Ort, T.L. Phillips, D.S. Seigler, C.A. Shearer, R.W. Tuveson, C.A. Wraight
Associate Professors: C.K. Augspurger, J.M. Cheeseman, A.G. Jones, M.L. Sargent, M.A. Schuler, C.J. Whitmarsh, R.E. Zielinski
Assistant Professors: D.R. Bush, E.H. DeLucia, S.R. Downie, T.W. Jacobs

Affiliates: S.G. Lazarowitz, L.I. Nevling, K.R. Robertson
Adjunct Professor: J.A.D. Parrish
Emeritus Professors: Z.B. Carothers, J.R. Laughnan

Graduate Degree Programs. The Department of Plant Biology offers graduate work leading to the master of science and doctor of philosophy degrees. It also participates in an interdepartmental study program leading to a doctoral degree in physiological and molecular plant biology.

Areas of specialization available within the department include anatomy, bioenergetics, biophysics, bryology, circadian rhythms, development, ecology, genetics/molecular biology, mycology, paleobotany, paleoecology, photosynthesis, phycology, physiology, phytochemistry, population biology, systematics, and ultrastructure. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization. A knowledge of the principles of ecology, genetics/molecular biology, morphology, physiology, and systematics is strongly recommended.

A brochure providing additional information about the department, its facilities, and the research interests of its faculty is available from the associate head upon request.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required. Graduate College admission requirements also apply.

Master of Science. Candidates for the MS degree are expected to fulfill the requirements of the Graduate College and to broaden and deepen their training in a program of course work and research agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser. The master's degree program is usually completed within two years.

Doctor of Philosophy. Candidates for the PhD are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

An evaluation of each student's academic progress will be made at the end of his or her second year of graduate study, and departmental approval must be obtained at this juncture in order to continue in a graduate degree program.

Outstanding Facilities. Outstanding teaching and research laboratories encompass both molecular and organismal plant biology and are complemented by growth-chamber facilities, environmentally controlled greenhouses, an excellent herbarium, and a paleobotanical center for collections.

Specialization in Genetics.* The Department of Plant Biology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Teaching assistantships, fellowships, and research assistantships are available for qualified students. A student who is awarded a fellowship may apply to have the stipend augmented with a part-time teaching or research assistantship.

**A proposal to establish a specialization in genetics is pending campus approval.*

LINGUISTICS

(Including African Languages: Afrikaans, Bambara, Hausa, Lingala, Swahili, Wolof, Yoruba, and Zulu; Arabic, Hebrew, Hindi-Urdu, Persian (Farsi), and Sanskrit)

Acting Head of the Department: Elmer H. Antonsen
Correspondence and Information: Head, Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E.H. Antonsen, D.E. Baron, W.C. Blaylock, E.G. Bokamba, G. Browne, C.C. Cheng, W.B. Dickerson, P.A. Gaeng, G.M. Green, H.H. Hock, E.B. Kachru, Y. Kachru, C.-W. Kim, C.W. Kisseberth, C. Kramarae, D.P. Kuehn, F.K. Lehman, H. Maclay, J.W. Marchand, J.L. Morgan, W.T. Pitard, G.L. Tikku, L. Zgusta.
Associate Professors: L.F. Bouton, J.R. Cowan, G. Dell, R. Dunatov, F.Y. Gladney, R.S. Hart, F.M. Jenkins, D. Kibbee, M. Mack, R. Pandharipande
Assistant Professors: F. Cassimjee, J. Cole, C. Fisher, S. Garnsey, S. Gonzo, J.I. Hualde, N.P. Markee, J. Packard, J.H.S. Yoon
Emeritus Professors: K.O. Aston, C.L. Dawson, H.R. Kahane

Graduate Degree Programs. The Department of Linguistics offers graduate programs leading to the master of arts and doctor of philosophy degrees. Work toward these degrees is divided into two major areas. General linguistics includes historical linguistics, phonology, semantics, and syntax. Applied linguistics covers experimental phonetics, language acquisition, lexicography, psycholinguistics, sociolinguistics, and stylistics. Other areas of concentration are artificial intelligence, cognitive science, and computational linguistics, as well as area linguistics (with concentration in African; Romance; Semitic; and South, West, or East Asian linguistics). Work in these areas may be done under general or applied linguistics. For an application and more detailed information on departmental programs, offerings, admission, degree requirements, and financial aid, write to the above address.

Admission and Advising. Undergraduate preparation for the study of linguistics at the graduate level should include the study of at least one foreign language; courses equivalent to Linguistics 300, 301, and 302 at this University; and a broad background in the humanities, social sciences, and mathematics. Graduate College admission requirements apply. The coordinator of graduate studies acts as adviser for new students. As students progress in their studies, they select their own adviser according to their individual needs and interests.

Master of Arts in General or Applied Linguistics. The aim of the master's program is to instruct students in the major areas of linguistic theory and the methods of linguistic analysis. Candidates for this degree must earn at least 10 units with a minimum grade-point average of 4.0 (A = 5.0) and satisfy other department and Graduate College requirements. Those concentrating on the general program are required to take Linguistics 307, 340, 401, 402, 411, 441, 442, and 3 units of electives. The applied program requires Linguistics 325, 340, 350, 401, 402, 441, 442, and 3 units of electives. Electives may not contain more than 1 unit of Linguistics 490. In addition, students must have proficiency in one language (other than their native tongue) that has a significant body of linguistic literature and must pass the qualifying examination. Instead of taking the examination, students wishing to obtain a terminal MA degree may write an acceptable MA thesis under Linguistics 490, for 1 unit in addition to the 10-unit course requirement (for a total of 11 units).

Doctor of Philosophy in General or Applied Linguistics. Admission to candidacy for the PhD requires a grade-point average of 4.5 or better for all graduate work in linguistics, distinction in passing the qualifying examination, achieving a grade of B or better in each of two courses in an approved sequence not covered by the qualifying exam, and submitting an acceptable original research paper that meets professional standards. In deciding whether

students will be admitted to the PhD program, the examination and student evaluation committee considers their performance in meeting these requirements, as well as their general potential for doing advanced linguistic research.

Candidates for the PhD degree must complete at least 26 units of graduate work, or 16 units beyond the master's degree. The minimum 26 units must include the course requirements listed above for the master's degree (or their equivalent), advanced courses as required for the area of specialization, and 8 units of thesis research. Candidates must also demonstrate proficiency in a language that is neither their native tongue nor the same language as that used to satisfy the first foreign language requirement. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to 2 units of credit granted under this program may be transferred. Candidates are required to take the preliminary examinations (written and oral) after completion of 8 units beyond the master's level and to present a talk at a meeting of the Linguistics Seminar. Before presenting their final dissertation defense, students are required to demonstrate familiarity with a non-Western language to ensure familiarity with the linguistic structure of a language substantially different from those routinely discussed in required courses.

Financial Aid. Approximately 90 percent of the graduate students in the department receive financial aid, either through the department or through other units in the University, in the form of fellowships, teaching assistantships, research assistantships, or departmental assistantships. New applicants receive automatic consideration for financial aid within the department, including teaching assistantships for the non-Western languages taught in its programs. For details and applications, write to the above address.

MATERIALS SCIENCE AND ENGINEERING

Head of the Department: J. Economy
Associate Head: J. Haltiwanger
Correspondence and Information: Head, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, 1304 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.J. Altstetter, R.S. Averback, R.L. Berger, H.K. Birnbaum, S.D. Brown, R.C. Buchanan, H. Chen, S. Danyluk, J. Economy, G. Erlich, R.J. Gaylord, P.H. Geil, J.E. Greene, K. Kim, F.V. Lawrence, J. Mazumder, R. Nuzzo, D.A. Payne, J.M. Rigsbee, T.J. Rowland, K. Schweizer, S.I. Stupp, C.M. Wayman, R.P. Wool, J.F. Young
Associate Professors: S. Granick, W.M. Kriven, I. Robertson, G.P. Wirtz, A. Zangvil
Assistant Professors: J. Abelson, J. Adams, L. Allen, D. Cahill, J. Kieffer, J. Lewis, A. Rockett, D. Viehland
Adjunct Professors: R. Benedek, M. Berg, S. Bhagwat, A. Kumar, D. Wilcox
Emeritus Professors: P.A. Beck, C. Bergeron, R.W. Bohl, R. Cook, E. Eckel, J. Nelson, F. Tooley, C.A. Wert, W. Williams, T. Willmore

Graduate Degree Programs. The Department of Materials Science and Engineering offers graduate work leading to the master of science and doctor of philosophy degrees. The student body and the faculty have widely varied backgrounds in science and engineering. Faculty members are carrying out research in many different areas, and students may choose to specialize in various aspects of materials science and engineering, including ceramics, metals, polymers, and electronic materials.

Admission. Graduate students have undergraduate degrees in a number of scientific and engineering disciplines. Admission to graduate study is based on undergraduate performance and letters of reference. International students are expected to be proficient in English.

Master of Science. A candidate for the master of science degree must complete a minimum of 8 units of graduate work, including a thesis. A 9-unit, nonthesis degree is also available for students who do not hold a research assistantship. Course work includes graduate courses in

the student's area of concentration (e.g., metals, polymers, ceramics, or electronic materials), as well as in other areas of materials science and engineering.

Doctor of Philosophy. The PhD degree requires, in addition to the requirements for the MS degree, 6 units of course work, including courses on the statistical thermodynamics of materials and the kinetic processes in materials, and 10 units of thesis credit. Course work will include graduate courses in the student's area of concentration, in other materials areas, and in other subjects in science and engineering. Students must pass the written departmental qualifying examinations covering the subjects of classical and statistical thermodynamics and kinetics, as well as meet additional requirements in the student's area of concentration. A preliminary examination covering the student's thesis research is also required. This examination consists of a brief written research proposal and an oral presentation by the student to a committee of faculty members. This committee will be available for consultation with the student throughout the course of thesis research and will then serve on the student's PhD final examination committee.

Financial Aid. Graduate students may be supported by research assistantships, fellowships, teaching assistantships, and waivers of tuition and service fees.

MATHEMATICS

Chair of the Department: C. Ward Henson
Director of Graduate Studies: Richard Jerrard
Correspondence and Information: Director of Graduate Studies, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, 1409 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: F.R. Albrecht, J.R. Alexander, Jr., K.I. Appel, S.B. Bank, I.D. Berg, E.R. Berkson, B.C. Berndt, R.L. Bishop, J. Bourgain, P.G. Braunfeld, D.L. Burkholder, R.W. Carroll, R.F. Craggs, E.C. Dade, J.P. D'Angelo, H.G. Diamond, E.G. Evans, Jr., R.M. Fossum, G.K. Francis, Z. Furedi, J.W. Gray, D.R. Grayson, P.A. Griffith, W.J. Haboush, W.R.G. Haken, H. Halberstam, M.E. Hamstrom, L.L. Helms, C.W. Henson, A. Hildebrand, G.J. Janusz, R.P. Jerrard, C.G. Jockusch, F.W. Kamber, R.P. Kaufman, P.A. Loeb, H.P. Lotz, L.R. McCulloh, L. McLinden, J.B. Miles, D.E. Muller, H.A. Osborn, J.I. Palmore, N.T. Peck, A.L. Peressini, W.V. Philipp, H.A. Porta, R.R. Rao, B.A. Reznick, D.J.S. Robinson, J.J. Rotman, L.A. Rubel, P.E. Schupp, K.B. Stolarsky, W.F. Stout, M. Suzuki, G. Takeuti, T.W. Ting, P.M. Tondeur, J.J. Uhl, Jr., S.V. Ullom, L. Van den Dries, J.H. Walter, P.M. Weichsel, J.E. Wetzel, S. Wolfram, J.M. Wu
Associate Professors: S.B. Alexander, P. Aviles, A. Babakhanian, J.W. Brown, L.L. Dornhoff, S. Dutta, A. Hinkkanen, D. Monrad, R.G. Muncaster, H. Paley, J. Pipher, E.G. Portnoy, D.R. Sherbert, E.C. Weinberg
Assistant Professors: M.J. Bergvelt, N. Boston, S.B. Bradlow, E.W. Gray, P.K. Newton, M. Nicolau, I.M. Reiner, Z. Ruan

Graduate Degree Programs. The department offers graduate study leading to the Master of Science (or of Arts) in Mathematics, the Doctor of Philosophy in Mathematics, the Master of Science in Applied Mathematics, and the Master of Science in the Teaching of Mathematics. An advanced certificate in community college mathematics teaching is also available.

Admission. Graduate College admission requirements apply. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics and a grade-point average of 4.25 (A = 5.0). Students whose undergraduate training in mathematics is deficient may be admitted with deficiencies to be removed during the first year of graduate study.

Master's Degree Programs. The master's degree programs can be completed in a year plus a summer or in one and one-half years of full time study by students entering without

deficiencies. Students entering with deficiencies may require two years to complete the degree. There are no thesis or language requirements, and no comprehensive examination is required. These programs may be revised; students are advised to check with the director of graduate studies.

The master's degree in mathematics requires a total of 8 units, of which 3 must be at the 400 level in mathematics. The master's degree in applied mathematics requires 8 units, of which 2 must be at the 400 level in mathematics. Specific course and sequence requirements for this degree can be satisfied through study in one of three options: (1) computation and optimization, (2) science applications, or (3) actuarial science.

The master's in the teaching of mathematics requires 8 units, of which 4 must be in mathematics and 2 in education. Specific course and sequence requirements must be met.

The advanced certificate in community college mathematics teaching is designed to be completed in two semesters following completion of a master's degree in mathematics. The program involves student teaching and specialized course work.

Doctoral Degree Program. Students working toward a PhD degree usually require from four to six years to complete the requirements. Each student must pass the comprehensive examination (testing the student's knowledge of basic graduate-level mathematics in algebra, analysis, and one other area) and the preliminary examination (testing the student's ability to begin or continue research in a chosen field). Students must also write and defend a research thesis in their field of mathematics. A reading knowledge of two of the following languages (excluding the student's native language) is required: English, French, German, Russian.

Financial Aid. Financial aid is available in the form of teaching assistantships, research assistantships, and fellowships. The same application is used for decisions on admission, assistantships, and fellowships. The deadline for equal consideration for fellowships and assistantships is February 15, but later applications for assistantships will be considered if positions are available. Students may be admitted without financial aid until a month before classes start.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: A.L. Addy
Associate Heads of the Department: A.M. Clausing and J.E. Peters
Graduate Policy Committee Chairperson: J.S. Walker
Correspondence and Information: Celia G. Snyder, Graduate Programs Coordinator, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, 140 Mechanical Engineering Building, 1206 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: A.L. Addy, R.J. Adrian, R.O. Buckius, C.W. Bullard, J.C. Chato, A.M. Clausing, T.F. Conry, H.E. Cook, C. Cusano, R.E. DeVor, J.C. Dutton, J.E. Greene, B.G. Jones, S.G. Kapoor, K. Kim, J.M. Koonce, H. Krier, C.S. Larson, J.S. Liebman, J. Mazumder, N.P. Moray, C.O. Pedersen, J.E. Peters, D.F. Socie, S.L. Soo, M.G. Strauss, J.J. Stukel, C.L. Tucker III, J.S. Walker, R.A. White, C.D. Wickens

Associate Professors: D.N. Assanis, R.A. Beddini, J. Bentsman, M.Q. Brewster, R.L. Burton, J.A. Dantzig, W.E. Dunn, R.E. Klein, A.F. Kramer, K.D. Lee, S.C-Y. Lu, D.L. Marriott, N.R. Miller, M.H. Moeinzadeh, T.A. Newell, A.J. Pearlstein, H.M. Reis, P.M. Sanderson, H. Sehitoglu, D.S. Stewart, J.F. Stubbins, B.G. Thomas, S.P. Vanka, L. Wozniak

Assistant Professors: S.M. Doane, P.M. Ferreira, M.A. Johnson, P.M. Jones, U.S. Palekar, M.L. Philpott, N.V. Sahinidis, D.L. Thurston, D.A. Tortorelli, T-C. Tsao, A.F. Vakakis

Graduate Degree Programs. The Department of Mechanical and Industrial Engineering offers studies leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, the Doctor of Philosophy in Mechanical Engineering, and the Doctor

of Philosophy in Industrial Engineering. Details outlining specific degree requirements are included in brochures available from the Graduate Programs Coordinator (address listed above).

Research Areas. Research in the Department of Mechanical and Industrial Engineering is broadly based, following the traditional disciplines of mechanical engineering and industrial engineering on the one hand and encompassing areas that are at the cutting edge of the profession on the other. The activities reflect not only the interests and creativity of our faculty and students, but also their responsiveness to societal problems. While the generation of new knowledge remains a basic function, a number of ongoing research projects have been prompted by the current needs of the state of Illinois and of the nation. Current areas of research include automotive systems engineering; bioengineering; combustion and propulsion; computer-aided design and manufacturing; control systems; energy systems and environmental engineering; fluid mechanics and gas dynamics; heat, mass, and momentum transfer; human factors and man-machine systems; knowledge-based expert systems and artificial intelligence; laser-aided materials processing; manufacturing engineering and integrated quality systems; materials engineering; materials processing; mechanical design and design methodology; lubrication and wear; multiphase mechanics and multiphase flow systems; nuclear power engineering; operations research; polymer processing; production management; robotics; solar energy; and thermal systems.

The department has a strong commitment to interdisciplinary research and works closely with other departments: the Department of Aeronautical and Astronautical Engineering in the fields of aerodynamics and combustion; the Department of Agricultural Engineering in petroleum and nonpetroleum fuels; the Department of Electrical and Computer Engineering in controls; the Department of Materials Science and Engineering in materials properties and processing; and the Department of Psychology in ergonomics and human factors engineering. Cooperation with the bioengineering faculty, the Coordinated Science Laboratory, and the Materials Research Laboratory also lends diversity to our research. The department also has strong involvement in several research center activities, including the Manufacturing Research Center, the Air Conditioning and Refrigeration Center, the National Center for Composite Materials Research, and the Institute for Competitive Manufacturing. Faculty and students are also involved in the campus Beckman Institute for Science and Technology and the National Center for Supercomputing Applications.

Admission. An applicant for admission to the Department of Mechanical and Industrial Engineering must (1) be a graduate of an institution awarding a baccalaureate degree equivalent to that granted by the University of Illinois at Urbana-Champaign, (2) be adequately prepared for advanced study as demonstrated by his or her previous program of study and scholastic record, and (3) be recommended for admission by the Department of Mechanical and Industrial Engineering. A minimum grade-point average of 4.25 (A = 5.0) for the last 60 hours of undergraduate study is required. On rare occasions, the department may recommend an applicant for admission with limited standing even if the admission grade-point average is below the required minimum. Scores on the Graduate Record Examination general test are required of all applicants who have attended non-U.S. colleges or universities and are strongly recommended for all other applicants. There is no language requirement. The department requires a minimum TOEFL score of 590 for applicants who have not completed at least two years at a U.S. institution. Based upon the previous preparation of the student, prerequisite courses may be specified by the adviser, but the credit may not be applied toward a degree.

Master of Science. A total of 8 units (including no more than 2 units of thesis credit) is required. For those students terminating their studies with the MS degree, a nonthesis option is available by departmental petition. Those pursuing the nonthesis option are required to complete a minimum of 9 units of credit. In such cases, the study program includes 1 unit of independent laboratory investigation, because each student is required to show evidence of the ability to do independent research.

Doctor of Philosophy. A master's thesis is required of all applicants for PhD study. Students who enter with a master's degree and who have not written a thesis or the equivalent must

demonstrate, through previous work or through registration in an independent laboratory investigation course, that they are capable of carrying out independent research. Qualifying examinations are to be taken during the semester in which the ninth unit of graduate credit is earned, at the earliest, but no later than the first semester thereafter. For students who enter with a master's degree, the qualifying examination must be taken the second semester of enrollment. A total of 14 units of course work (including the course work taken at the MS level) beyond the BS degree is the minimum course work requirement for the PhD degree. The minimum total requirement for the PhD degree is 24 units, including thesis research credit. The preliminary examination is taken upon completion of all required course work for the PhD degree or during the semester in which the final course work is taken, but no sooner. The preliminary examination for the doctoral degree should be completed no later than two years after the student completes Stage 1 (master of science degree or equivalent) of the doctoral program. A minimum of six months should elapse between the successful completion of the doctoral preliminary examination and the doctoral final examination. Upon satisfactory completion of the preliminary examination, the candidate completes the research phase (including the thesis) and takes a final oral thesis defense examination.

Financial Aid. Financial assistance, available on a competitive basis, includes fellowships, assistantships, and waivers of tuition and fees. Assistantship stipends vary with the student's entry level into the program.

MEDICAL SCHOLARS PROGRAM

Correspondence and Information: Coordinator, Medical Scholars Program, College of Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801

Graduate Degree Programs: The Medical Scholars Program at the Urbana-Champaign campus enables students to combine the study of medicine leading to the MD with graduate or preprofessional study in a second field leading to the PhD, JD, MBA, or MS (Biostatistics). The program seeks to produce leaders uniquely qualified and motivated to address the issues shaping modern medical practice, the health care system, and biomedical research, issues related to the profound advances in science and technology and those that arise from the pressures of socioeconomic forces.

Admission: To enter the Medical Scholars Program (MSP), applicants must meet the admission requirements of, and be accepted by, both the College of Medicine and the graduate unit of their choice. Prospective students must demonstrate a potential for creativity and original research, a sense of social awareness and service, academic excellence, competence in leadership and in interpersonal relationships, and an appropriate rationale for their interest in combined study. Application is made to the program and to the graduate unit by means of the Medical Scholars Program application form. Application is made to the University of Illinois College of Medicine through the AMCAS application system sponsored by the Association of American Medical Colleges. The Medical College Admissions Test (MCAT) is required for admission to medical school, and examination scores such as those for the GRE, GMAT, or LSAT are required by some departments. Applicants must arrange to take such examinations and have the scores forwarded to the appropriate academic unit on the Urbana-Champaign campus. All U.S. citizens and permanent residents are eligible to apply. State residency is not a factor.

Approved Areas of Specialization: The University offers graduate study in more than 100 fields in which MSP applicants may propose combined-degree study, including the following established programs:

Accountancy
Anthropology
Architecture
Art and Design
Biochemistry
Biophysics
Business Administration
Cell and Structural Biology
Chemical Engineering
Communications Research
Community Health
Computer Science
Ecology, Ethology, and Evolution
Economics
Education
Electrical and Computer Engineering
English
Entomology
Environmental Toxicology
Finance
Food Science
History
Kinesiology
Law
Materials Science and Engineering
Mathematics
Mechanical and Industrial Engineering
Microbiology
Neuroscience
Nuclear Engineering
Nutritional Sciences
Philosophy
Physics
Physiology
Political Science
Psychology
Slavic Languages and Literatures
Social Work
Sociology
Speech and Hearing Science
Speech Communication
Statistics
Theoretical and Applied Mechanics
Veterinary Biosciences
Veterinary Pathobiology

Special Features of the Program: The Medical Scholars Program stands out from other MD/PhD programs in its size (up to 25 students are admitted annually; more than 135 are currently enrolled) and in the range of second degree disciplines offered (students have enrolled in more than forty different graduate programs). Located in the heart of the University of Illinois at Urbana-Champaign campus, the MSP offers graduate programs in any discipline within the biological and physical sciences, as well as in the social sciences, humanities, and law.

Requirements: Students in the Medical Scholars Program are expected to fulfill all the degree requirements of both the College of Medicine and the second discipline. Faculty advisers from the medical school and from the graduate unit help students set realistic long-term study plans that integrate the two curricula.

Financial Aid: Currently, all Medical Scholars receive financial support for the duration of both their medical studies and their graduate studies. Virtually all MSP students are assured waivers of tuition and fees, and the vast majority also receive stipends. In general, financial support is provided by the graduate department in the form of assistantships, which vary in amount, depending on the time involved and the department. Medical Scholars may also earn fellowships and other awards for additional or alternative support.

MUSIC

(Including Music Education and Musicology)

Director of the School: Don V Moses
Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, 2136 Music Building, 1114 West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: S. Berry, E. Boardman, F. Crawford, E. Dalheim, N. DiVirgilio, K. Drake, M. Dunn, B. Edlefsen, M. Elyn, T. Fredrickson, L. Gushee, R. Hedlund, J. Hill, I. Hobson, M. Hoffman, J. Keene, H. Kellman, D. Kohut, J. Lyke, S. Martirano, J. Melby, A. Murray, B. Nettl, D. Peters, M. Powell, P. Schaffer, J. Shapiro, T. Siwe, N. Temperley, P. Vermel, T. Wisniewski, J. Wustman, S. Wyatt, M. Zimmerman, P. Zonn
Associate Professors: R. Alexander, C. Alwes, J. Beauchamp, Z. Browning, M. Cameron, C. Capwell, E. Chasanov, M. Ewald, J. Grant, J. Grashel, D. Harris, L. Laufman, K. Machala, M. Moore, D. Richtmeyer, N. Rosen, R. Sasaki, F. Stoltzfus, S. Stone, S. Tipei, H. Von Gunden, T. Ward
Assistant Professors: W. Brooks, O. Davis, F. Fairchild, V. Farmer, E. Harwood, S. Lupu, M. McClelland, T. Turino

Graduate Degree Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education. Complete details of these programs may be found in the school's brochure on graduate study in music.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the MMus degree are musicology, music theory, composition, performance and literature (piano, organ, voice, orchestral instruments), choral music, instrumental conducting, vocal accompanying and coaching, and group piano pedagogy.

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution (students holding other degrees may be admitted but will be expected to make up any deficiencies). Those majoring in musicology are generally expected to have a minimum grade-point average of 4.25 (A = 5.0). Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings. Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each of college-level French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students who are otherwise admissible may satisfy any language deficiencies concurrently with graduate studies.

Degree Requirements. Candidates for the MMus degree in theory-composition and in performance and literature must earn at least 8 units, including 2 units at the 400 level in their major field and 1 unit in problems and methods. Candidates in performance and literature must earn 2 units in the music literature course in their major applied area. Candidates in musicology must earn 2 units in introduction to musicology and 2 units in the seminar in musicology. Electives in music theory, history and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate adviser. Each candidate for the MMus

must participate in an ensemble during two of the terms of study. A graduate recital is required of all candidates in performance and literature. Candidates in musicology and theory must write a thesis, for which 2 units of credit are given. Candidates in composition must present a portfolio of their works for approval by the composition faculty.

Doctor of Musical Arts. The fields of specialization for the DMA degree are composition, piano, organ, choral music, voice, violin, viola, cello, wind instruments, and percussion instruments.

Admission. Prerequisites for admission are the following: (1) the MMus degree from the University of Illinois at Urbana-Champaign, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above; (2) a high level of proficiency in composition or performance; candidates in composition must submit original scores for review, and candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings; (3) appropriate experience in ensemble performance and/or score reading; (4) the successful completion of approximately 32 semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of 6 hours in history and 6 hours in literature and philosophy; candidates in voice must have fulfilled all foreign language requirements considered prerequisites for the MMus degree.

Degree Requirements. Candidates must earn a minimum of 16 units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of 3 units in the major field of specialization, 2 units in advanced music literature courses, and 2 units in a minor field. Candidates take a preliminary examination once they complete all course work.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester, 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition and of performance and literature, 6 units are devoted to a special doctoral project. Composers must produce a large-scale original score. Performers must demonstrate comprehensive repertory study in the form of two solo recitals or one solo recital and two of the following options: performing a concerto, a major operatic or oratorio role, or a chamber music program; giving a lecture-recital; or preparing and, when appropriate, conducting a concert by an instrumental or vocal ensemble. Those majoring in one of the string instruments must also present a recital of chamber music. In addition, both fields have a research requirement that serves in lieu of a thesis. In the field of choral music, 1 unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory, and 4 units are devoted to the writing of a thesis.

Doctor of Philosophy in Musicology. The PhD in musicology is intended for those whose interests lie in research in the history of music, systematic musicology, or ethnomusicology.

Admission. Prerequisites for admission are (1) the MMus degree in musicology from the University of Illinois at Urbana-Champaign or an equivalent degree from another accredited institution; (2) a minimum of 32 semester hours in the liberal arts and sciences, usually including general history, philosophy, and literature.

Degree Requirements. A minimum of 16 units must be earned beyond the requirements for the master's degree, including at least 2 units in the seminar in musicology. Although no formal outside minor is required, students are expected to take courses in fields outside music that are appropriate to the proposed area of thesis research. A preliminary examination is taken after all course work is completed.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester, 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Usually, 8 of the total of 16 units are devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 4.0. Candidates for this degree must earn a minimum of 4 units in music courses, 2 units in education courses, and 2 units of electives. One of the 4 units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in their major performing medium during the registration period of their first term in residence. Each candidate for the MS must participate in an ensemble during two of the terms of study. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have satisfactorily completed two years of professional employment in music education. During the student's first registration period, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of 8 units beyond the master's degree is required, including 1 unit in music education courses and 1 unit in educational psychology.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music, music education, or a related academic discipline acceptable to the Graduate Committee for Music Education. Admission is determined by examinations in music history, music theory, music education, and applied music; personal interviews; records of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies Test should accompany the application for admission.

Program. At least 16 units of work beyond the master's degree are required, including 6 units in music courses and 6 units in education courses. No more than 2 units of credit in applied music may be counted toward the degree. A thesis is required; it may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled either by full-time study in two consecutive semesters or by full-time study in one semester, a contiguous summer session, and one additional summer session.

Financial Aid. Fellowships, teaching and research assistantships, and tuition and service fee waivers are awarded on a one-year basis with continuation dependent upon success in the program. Specific information on application procedures is available from the Graduate Office, School of Music.

NUCLEAR ENGINEERING

Head of the Department: Barclay G. Jones
Correspondence and Information: Department of Nuclear Engineering, University of Illinois at Urbana-Champaign, 214 Nuclear Engineering Laboratory, 103 South Goodwin Avenue, Urbana, IL 61801-2984

GRADUATE FACULTY

Professors: R.A. Axford, D.G. Cacuci, B.G. Jones, K. Kim, G.H. Miley, J.F. Stubbins, R.J. Turnbull
Associate Professors: S. Landsberger, M. Ragheb, D.N. Ruzic, C.E. Singer
Assistant Professors: W.H. Choe, A.M. Ougouag, J. Schwartz

Graduate Degree Programs. The Department of Nuclear Engineering offers work leading to master of science and doctor of philosophy degrees.

Admission. Application for admission to the MS and PhD programs is open to all graduates in engineering, mathematics, and the physical sciences with an average grade of B or better for the last 60 hours of undergraduate work and any graduate work completed. Prerequisites for admission include a course in ordinary differential equations plus one other mathematics course beyond calculus; an intermediate course in atomic physics; a course in electrical circuit theory; a course in thermodynamics; and a course either in fluid mechanics or in continuum mechanics. A student may be admitted before completion of these prerequisites, but he or she must allow additional time for making up these deficiencies; courses taken to make up such deficiencies will not count toward the number of units required for the degree. Transcripts are required; letters of recommendation and information such as undergraduate class rank are recommended. International students must demonstrate proficiency in English, as measured by the TOEFL and SPEAK (Speaking Proficiency English Assessment Kit) tests, with minimum scores of 550 and 230, respectively. They may be required to take courses in English as a Second Language, as determined by English placement tests taken on campus.

Master of Science. The MS degree takes at least two semesters and a summer session to complete and normally takes three semesters and a summer session; 8 units of graduate work are required, including an MS thesis. The curriculum requires courses covering the fundamentals of nuclear engineering, plus two or more courses in an area of concentration chosen by the student in consultation with an adviser. Typical areas include fission systems, fusion systems, reactor physics, plasma physics, radiation transport, nuclear materials, reactor thermal hydraulics, reactor safety, neutron activation analysis, radioactive waste management, health physics, radiation protection, and superconducting magnet design and development.

Doctor of Philosophy. Course requirements for the PhD degree include at least 8 units of course credit beyond that required for the MS degree. In addition, 8 or more units of doctoral thesis credit are required and typically take one or more years to complete. Students desiring to work toward the PhD degree must pass the qualifying examination to be admitted to doctoral study. The doctoral candidate must complete course work, pass a preliminary doctoral examination, write a doctoral thesis, and successfully defend the thesis at a final examination. A doctoral student typically takes several courses in nuclear engineering plus additional courses that support a specialized research area and/or provide background in mathematics and science and that satisfy a minor in a related discipline. There is no foreign language requirement. Under exceptional circumstances and by approved petition, doctoral research may be undertaken off campus.

Research Interests. Faculty research interests cover a wide range including, but not limited to, those listed above under the Master of Science section.

Facilities. Several major facilities are available for nuclear engineering research. The versatile Illinois Advanced TRIGA reactor operates at 1.5 megawatts steady state and pulses to 6,000 megawatts peak power. A low-power reactor facility, adjacent to the TRIGA, provides unique coupled-core experimental capabilities. A dense plasma focus fusion-related device for high-

temperature plasma studies and an ultrahigh-vacuum laboratory for plasma-material interaction studies are available. The College of Engineering's Materials Research Laboratory and Materials Engineering–Mechanical Behavior program provide a variety of facilities for studies of nuclear materials. Other laboratories are also available for environmental studies and nuclear spectroscopy; health physics and radiation studies; nuclear waste management; thermal hydraulics and reactor safety; reactor physics and reactor kinetics; controlled nuclear fusion; direct energy conversion; lasers and plasma physics; and superconducting magnet design and application. The College of Engineering is a leader in supercomputer research, and the campus houses one of the National Centers for Supercomputing Applications. The Department of Nuclear Engineering also has a direct link to the National Magnetic Fusion Computer Center in Livermore, California. In addition, microcomputers are available for student use and are integrated into laboratory courses and for data acquisition.

Financial Aid. Fellowships and traineeships are generally available to support the best applicants. Aid in the form of research assistantships and teaching assistantships is available for most other graduate students. Other work of a professional nature can sometimes be found in the University or surrounding community. If the number of students is more than the department can assist financially, support is awarded according to academic merit.

NUTRITIONAL SCIENCES

Director of the Division: John W. Erdman, Jr.
Correspondence and Information: Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, 451 Bevier Hall, 905 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: D.H. Baker, L.A. Birch, R.A. Boileau, B.M. Chassy, J.H. Clark, R.A. Easter, J.W. Erdman, Jr., G.C. Fahey, Jr., P.V. Johnston, S.K. Kamath, K.E. Kelley, B.P. Klein, D.K. Layman, R.A. Nelson, T. Nishida, W.D. O'Brien, E.G. Perkins, J.L. Robinson, A.A. Salyers, A.J. Siedler, W.J. Visek
Associate Professors: P.E. Bowen, B.H. Cho, A.S. Hassan, T.F. Hatch, A.K. Hatfield, E.H. Jeffery, R.L. Magin, N.R. Merchen, M.R. Murphy, J.E. Novakofski, S.J. Schmidt
Assistant Professors: K.M. Chapman, S.M. Donovan, J.K. Drackley, L.L. Ji, J.A. Kaput, J. Odle, S.M. Potter, K.W. Singletary, R.J. Stillman, M.A. Wallig, M.M. Weigel
Emeritus Professors: C.L. Davis, R.M. Forbes, B.L. Larson, S.P. Mistry, E. Sleator

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science in Nutritional Sciences and the Doctor of Philosophy in Nutritional Sciences is offered. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes; animals, including human beings; nutritional biochemistry; and the chemistry of nutritional compounds and nutrition education. The program offers the opportunity for pursuing both the MD and PhD degrees in the Medical Scholars Program.

Admission and Financial Aid. Applicants are expected to have an admission grade-point average of 4.0 (A = 5.0) for the last 60 hours of course work and basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of traineeships, assistantships, and fellowships. Applicants seeking August admission and expecting to be considered for financial assistance should file their applications before the preceding February 15th. Later applications will be considered, depending on the space and support available.

Master of Science. Requirements for the MS include courses in general biochemistry, two courses in advanced nutrition, and one semester of seminar. Additional courses are available in such diverse subjects as human and animal nutrition, biochemistry, physiology, immunology, food science, education, anthropology, psychology, sociology, statistics, and agricultural

economics. The MS degree may be taken with or without a thesis. The minimum MS course work requirement is 6 units (plus at least 2 units of thesis credit) for the thesis degree and 9 units for the nonthesis degree.

Doctor of Philosophy. In addition to maintaining a 4.0 average in formal course work, PhD students are required to take an oral preliminary examination and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to have competence in English. A minimum of 24 units of credit work beyond the baccalaureate degree is required.

PHILOSOPHY

Chair of the Department: T.G. McCarthy
Correspondence and Information: Inquiries and correspondence should be directed, as appropriate, either to the Chair, the Director of Graduate Studies, or the Admissions and Financial Aid Committee, Department of Philosophy, University of Illinois at Urbana-Champaign, 105 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.E. Caton, A. Melnick, R.D. Mohr, R.L. Schacht, J.D. Wallace, P.G. Winch
Associate Professors: M.W. Baron, H.S. Chandler, T.G. McCarthy, R.J. McKim, F.W. Neely, F.F. Schmitt, W.R. Schroeder, S.J. Wagner, R.G. Wengert
Assistant Professors: K. Akins, P.L. Maher, J. McMahan
Emeritus Professors: B.J. Diggs, M.H. Fisch, D.S. Shwayder, A.R. Turquette, F.L. Will

Master of Arts. The normal program of graduate study in philosophy is directed toward the PhD, but students who wish to work only for the master of arts degree may also be admitted.

Admission. The Graduate College admission requirements apply. Applicants need not have done the course work in philosophy expected of applicants to the PhD program, but must show some evidence of aptitude for graduate study in philosophy. Application materials required are the same as those for the PhD program.

Program Description. Students in the AM program may qualify for the degree by earning at least 8 units of graduate credit with at least a 4.0 grade-point average (A = 5.0), 6 of which must be earned in regular courses; by satisfying a one-year residence requirement; by submitting a substantial essay; and by passing an oral examination on this essay. (There are no area, logic, or foreign language requirements for this degree.) An AM degree earned in this way is usually a terminal one. Students admitted to the AM program may, however, petition to the department for admission to the PhD program either before or upon completion of their requirements for the AM degree. (Students in the PhD program are automatically awarded this degree when they complete the second stage of the PhD program and are not required to submit the substantial essay or to pass the oral examination required for the terminal AM degree.)

Doctor of Philosophy.
Admission. The Graduate College admission requirements apply. In addition, applicants should have had a course in symbolic logic and general courses in the history of ancient and early modern philosophy. Students deficient in these areas may be admitted, but they are required to remedy their deficiencies by taking such courses in their first year. Applicants should also have done some course work in such central areas of philosophical inquiry as ethics and the theory of knowledge. All applications for admission must be supported by three letters of recommendation from persons qualified to comment on the applicant's aptitude for graduate study in philosophy. All applicants are also urged to take the general aptitude portion of the Graduate Record Examination and to submit their scores. They are further urged to submit a sample of their written work. International applicants whose native language is not English should take the TOEFL examination and submit their scores; a score of at least 600 is required for regular admission.

Program Description. The PhD program has three stages. (1) The first stage is completed when a student has earned 8 units of graduate credit or is deemed completed if the student has received a master's degree in philosophy elsewhere. (2) The second stage is completed when the student has earned 8 additional units (or, having received a master's degree previously, has earned and has been allowed transfer credit for a total of 16 units) and has satisfied the preliminary examination requirement, a course distribution requirement, a foreign language requirement, and a logic requirement (see below). At least 12 of the 16 units must be earned in regularly scheduled courses and seminars, and at least 5 must be earned in seminars. (3) The third stage is completed when the student has earned another 8 units of graduate credit (usually in seminars and thesis research) and has satisfied the thesis and doctoral oral examination requirements (see below). A minimum grade-point average of 4.0 (A = 5.0) is required for the PhD degree. Candidates must also satisfy the Graduate College residence requirement.

Candidates need not take work in a minor field outside the department. In cases in which advanced study in philosophy would be enhanced by study in a related discipline, students may use such related course work to satisfy the credit requirements for the degree. Credit toward the satisfaction of these requirements in such cases is limited to 2 units. If a student wishes the work to count as an extradepartmental minor, the minimum number of units accepted is 2 and the maximum is 4.

The department offers three main fields of concentration: (1) the history of philosophy (including recent Anglo-American philosophy and Continental philosophy); (2) the theory of knowledge (including philosophy of science and philosophy of language) and metaphysics (including philosophy of mind and philosophy of religion); and (3) ethics and value theory (including social and political philosophy and aesthetics). Students may specialize in any of these areas but must demonstrate competence in all of them. Two graduate-level courses must be taken in each of these three areas (the course distribution requirement). The two-part preliminary examination covers the latter two areas, with a knowledge of the history of philosophy to be demonstrated in each part.

Students must also demonstrate either (1) a basic reading knowledge of two of the following languages: German, French, Greek, and Latin; or (2) high proficiency in one of these languages. (Substitution of another language requires the permission of the chair of the department.) In addition, students must demonstrate competence in symbolic logic, either by passing an approved course in the subject or by passing a proficiency examination administered by the department.

There is no separate master's degree requirement for PhD candidates. The AM degree in philosophy is automatically awarded to those who have not earned this degree previously elsewhere when they satisfy the above requirements.

After satisfying these requirements, a candidate for the PhD must submit an acceptable dissertation and pass a final, oral examination on the thesis. The acceptability of the thesis is judged and the final examination administered by the candidate's doctoral committee.

PhD candidates who wish simultaneously to pursue advanced degrees in other disciplines (e.g., medicine or law) are permitted to do so. (For example, see the description elsewhere in this catalog of the Medical Scholars Program.)

Financial Aid. Financial aid is available to many students in the form of fellowships, assistantships, and waivers of tuition and service fees. The maximum period for which students may expect to receive financial aid is five years; exceptions may be made in some cases (e.g., when students are pursuing several advanced degrees simultaneously). Each year, the department reviews the performance of students receiving financial aid in order to determine whether their support should be continued. Students receiving transfer credit for graduate work in philosophy done elsewhere lose one semester of eligibility for financial aid for each 4 units of transfer credit allowed.

PHYSICAL SCIENCES

Correspondence and Information: D. Secrest, University of Illinois at Urbana-Champaign, 316 Noyes Laboratory, 505 South Mathews Avenue, Urbana, IL 61801

Graduate Degree Programs. Two degree programs in physical sciences, one leading to the Master of Science in Physical Sciences and the other leading to the Master of Science in the Teaching of Physical Sciences, are offered for active or potential secondary school teachers. Teacher certification is required for admission to either program. A thesis is optional. No more than 2 units of thesis credit may be applied toward degree requirements. There is no language requirement. At least 3 units of credit applied to these degrees must be at the 400 level.

Master of Science. This program is designed to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa.

All courses in astronomy, chemistry, computer science, geology, mathematics, and physics that usually may be applied for graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus for which calculus is a prerequisite.

Master of Science in the Teaching of the Physical Sciences. Students in this program must earn 4 units in the physical sciences, 2 units in education (see page 80), and 2 units of electives in education or physical science, or, in exceptional cases, in other fields.

PHYSICS

Head of the Department D.K. Campbell

Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, 215 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: A.C. Anderson, G.A. Baym, M.K. Brussel, D.K. Campbell, L.S. Cardman, D.M. Ceperley, S.J. Chang, Y.C. Chang, T.C. Chiang, P.D. Coleman, P.T. Debevec, P.G. Debrunner, J.G. Eden, G. Ehrlich, B.I. Eisenstein, R.A. Eisenstein, C.P. Flynn, E.H. Fradkin, H. Frauenfelder, J.M. Gibson, D.M. Ginsberg, G.E. Gladding, A.V. Granato, E. Gratton, P. Handler, K. Hess, L.E. Holloway, N. Holonyak, I. Iben, E.A. Jackson, L.M. Jones, M.V. Klein, J.B. Kogut, M.J. Kushner, F.K. Lamb, P.C. Lauterbur, A.J. Leggett, K.Y. Lo, D.E. Mapother, R.M. Martin, J.M. Mochel, T.Ch. Mouschovias, A.M. Nathan, T.A. O'Halloran, V.R. Pandharipande, C.N. Papanicolas, C.J. Pethick, D. Pines, F.M. Propst, M.J. Raether, D.G. Ravenhall, M.B. Salamon, K. Schulten, K.S. Schweizer, R.O. Simmons, C.P. Slichter, L.L. Smarr, J.D. Stack, H.J. Stapleton, G. Stillman, J.D. Sullivan, J.J. Thaler, J.W. Truran, J. Wambach, W.D. Watson, M.B. Weissman, J.E. Wiss, J.P. Wolfe, P.G. Wolynes, H.W. Wyld, R.D. Young

Associate Professors: S. Errede, N.D. Goldenfeld, G. Gollin, S. Granick, S.A. Lamb, H. Morkoc, M.H. Nayfeh, Y. Oono, D.N. Ruzic, R.L. Schult, M. Stone, D.C. Sutton, L.A. Thompson, D.J. Van Harlingen

Assistant Professors: D.H. Beck, D. Cahill, P.M. Goldbart, D.W. Hertzog, A.W. Hübler, T.M. Liss, G.U. Nienhaus, N.H. Packard

Graduate Degree Programs. The Department of Physics offers graduate work leading to the master of science and the doctor of philosophy degrees. There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic

and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, biomolecular, and surface physics; the properties of liquid helium; laser spectroscopy of atoms; nonlinear dynamics; and complex systems. Graduate study in several areas of applied physics is available in conjunction with other departments in the University.

Admission. Requirements for admission to the graduate program in physics, in addition to those of the Graduate College, are 20 hours of physics, excluding courses in general physics and including a semester of intermediate theoretical mechanics, and two semesters of intermediate electricity and magnetism or the equivalent. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics, and undergraduate study of a foreign language are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science. This program requires 8 units of graduate courses and is usually completed in one year of full-time study by students entering in full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the graduate advising office of the Department of Physics.

Doctor of Philosophy. Students working for the PhD degree usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following eighteen months. Departmental requirements for the doctor of philosophy degree, in addition to the general requirements of the Graduate College, are described in a pamphlet that may be obtained from the graduate advising office of the Department of Physics.

Related Programs. For information concerning astronomy, see page 59; for atmospheric sciences, page 61; biophysics, page 122; geophysics, page 97. A doctoral program in chemical physics is described on page 66.

PLANT PATHOLOGY

Head of the Department: Richard E. Ford

Correspondence and Information: Head, Department of Plant Pathology, University of Illinois at Urbana-Champaign, N519 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.L. Crane, C.J. D'Arcy, S.K. Farrand, R.E. Ford, L.E. Gray, M.E. Irwin, P.D. Shaw, M.C. Shurtleff, J.B. Sinclair

Associate Professors: D.I. Edwards, D.A. Glawe, H.W. Kirby, R.B. Malek, G.R. Noel, J.K. Pataky, J.D. Paxton, W.L. Pedersen, S.M. Ries, D.G. White, H.T. Wilkinson

Assistant Professors: W. Chen, L.L. Domier, D.A. Eastburn, C.E. Eastman, A.D. Hewings

Graduate Degree Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the master of science and doctor of philosophy degrees. All students are required to present themselves to the program-of-study committee for an oral examination in plant pathology after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; mycology; phytobacteriology; fungicides; physiology of fungi; biochemistry of plant diseases; biological control; disease resistance; etiology; epiphytology; soil-borne diseases; genetic and biotechnical engineering of microorganisms; and genetics and variability in plant pathogens.

Admission. Applicants for graduate study must have a BS degree in a biological science from an accredited university. Application files are screened by a departmental admissions committee. Graduate College requirements, including the 4.0 (A = 5.0) minimum grade-point average, apply. We recommend that students take the GRE and have strong letters of reference.

Master of Science. A candidate for the master of science must complete 8 units of credit, including the presentation of an acceptable thesis, and must pass an oral examination. Three units must be in 400-level courses, and 2 of the 3 must be in the major field. Limited credit in equivalent courses earned at other institutions may be accepted at the discretion of the department head and the student's program-of-study committee. Candidates must maintain a minimum grade-point average of 4.0 (A = 5.0) for the master's program.

Doctor of Philosophy. Students working toward the PhD degree usually require three additional years beyond the master's. To qualify for the preliminary examination, students must complete 8 units of course work, including required courses, beyond the master's degree. An oral preliminary examination before five faculty members, including at least three within and one from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable thesis based on original research by the student. Experience in teaching is a vital part of the graduate program and is required as part of the academic work of all PhD candidates. A grade-point average of at least 4.0 is required for the PhD degree.

Specialization in Genetics.* The Department of Plant Pathology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. Financial aid for graduate students in plant pathology is available as fellowships, research assistantships, and tuition and partial fee waivers. Qualified candidates are considered automatically for financial support upon application. Graduate students must make satisfactory progress toward their degree in order to renew their annual contract for support.

**A proposal to establish a specialization in genetics is pending campus approval.*

POLITICAL SCIENCE

Head of the Department: George T. Yu

Correspondence and Information: Director of Graduate Studies, Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: L.H. Carmen, S.P. Cohen, A.B. Fields, R.E. Kanet, E.A. Kolodziej, J.H. Kuklinski, D.F. Linowes, R.L. Merritt, S.S. Nagel, P.F. Nardulli, D.M. Pinderhughes, R.F. Rich, M.G. Weinbaum, M.E. Weinstein, R. Weissberg, F.M. Wirt, G.T. Yu, D.A. Zinnes

Associate Professors: P.F. Diehl, S.A. Douglas, M.A. Krassa, P.J. Quirk, S.T. Seitz

Assistant Professors: M.L. Bowen, G.A. Diamond, M.D. McBurnett, C.L. Mock, G.L. Munck, M.A. Orlie

Graduate Degree Programs. The Department of Political Science offers graduate work leading to the degrees of master of arts and doctor of philosophy.

Admission. The Graduate College admission requirements apply for all programs. The student should have a minimum of 20 hours of undergraduate work in political science and cognate disciplines such as economics, psychology, finance, sociology, or history. An applicant is required to submit Graduate Record Examination scores; one with prior graduate work is required to submit an example of work written during graduate studies. A minimum TOEFL score of 590 is required of all international applicants whose native language is not English.

Master of Arts. Students can earn a Master of Arts in Political Science usually within one year. It entails the completion of 8 units and the achievement of a 4.0 GPA in all courses taken. A master's thesis is required.

Doctor of Philosophy. The course of study leading to a PhD in Political Science requires a minimum of three years of full-time study, culminating in the successful defense of a doctoral dissertation. Two of the three years must be spent in residence. University residence requirements also state that a doctoral candidate must spend two successive semesters in residence beyond the master's degree. A minimum of 24 units of academic credit is required, 8 of which may be units of dissertation research.

In addition to meeting Graduate College requirements, the Department of Political Science requires that students complete a "scope and methods" sequence, acquire proficiency in analytic skills, and demonstrate expertise in several subfields within the discipline. The progress of PhD candidates is monitored at various points in the program. In addition to an interim evaluation, students must pass a set of qualifying examinations and present a dissertation proposal. Once the doctoral dissertation is completed, the candidate must successfully complete an oral final defense.

PhD candidates concentrate in one of six fields of political study: American government and politics, comparative government and politics, international relations, formal theory and empirical methodology, political philosophy, or public policy.

Financial Aid. Students accepted into the department's graduate program are eligible to apply for financial aid. Most incoming students with good credentials and continuing students demonstrating satisfactory progress will receive some type of financial aid, but the type and amount will vary. The Department of Political Science provides, on a competitive basis, aid packages up to $9,000, plus waivers of tuition and partial fees. Financial aid is usually a combination of fellowship money and assistantships. Students not requiring or qualifying for these types of assistance may apply for a tuition and fee waiver. Limited amounts of aid are also available for such things as dissertation field research, internships, and the presentation of papers at professional meetings. The University of Illinois is also a participating member of the Committee on Institutional Cooperation, which provides predoctoral grants to facilitate research in developing countries.

PSYCHOLOGY

Head of the Department: Emanuel Donchin

Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 337 Psychology Building, 603 East Daniel Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: P. Arabie, D.A. Bernstein, K. Bock, D. Budescu, G.L. Clore, M. Coles, J.H. Davis, J. DeLoache, E. Diener, E. Donchin, F. Drasgow, D.E. Dulany, C.W. Eriksen, M. Fishbein, M. Gabriel, W.T. Greenough, J. Hirsch, C.O. Hopkins, L. Hubert, C.L. Hulin, L. Jones, F. Kanfer, S. Komorita, P.R. Laughlin, G. Logan, J. Malpeli, R. McDonald, J.E. McGrath, N. Moray, J. Rappaport, E. Satinoff, E. Shoben, T. Srull, H.C. Triandis, S. Wasserman, C. Wickens, R. Wyer

Associate Professors: R. Baillargeon, M. Banich, P. Carnevale, G. Dell, F. Fincham, L. Fitzgerald, D. Irwin, J. Juraska, A. Kramer, G. Miller, P. Miller, G. Murphy, B. Ross, E. Roy, P. Sanderson, J. Sniezek, J. Tanaka

Assistant Professors: M. Aber, H. Berenbaum, U. Bockenholt, N. Cohen, S. Doane, E. Dzhafarov, C. Fisher, S. Garnsey, T. Harpur, W. Heller, G. Lintern, R. Mandel, S. Mangelsdorf, K. Miller, J. Rhodes

Graduate Degree Programs. The Department of Psychology offers graduate work leading to the degrees of master of arts, master of science, and doctor of philosophy. Doctor of philosophy programs are offered in the following areas of psychology: biological, developmental, cognitive, and clinical psychology; perception and performance; personality and social ecology; quantitative; and social/organizational individual differences. The master of arts degree is awarded to students in the above programs as an intermediate degree. Master of science programs are offered as terminal degrees in personnel psychology, engineering psychology, and applied measurement psychology.

Admission. The Graduate College admission requirements apply for all programs. The candidate for admission to a master of arts or doctor of philosophy program should ordinarily have the following preparation: a minimum of 15 hours in psychology, a laboratory course in experimental psychology, a course in statistics, a one-year course in another laboratory science, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have some research experience. Applications for admission to part-time study are usually not approved.

Master of Arts. The master of arts degree is awarded as an intermediate degree to students who are PhD candidates, when they have satisfactorily completed 8 units of graduate work, including an acceptable thesis.

Master of Science. The degree of Master of Science in Personnel Psychology, in Engineering Psychology, or in Applied Measurement is awarded as a terminal degree to candidates who have had an appropriate applied psychology undergraduate program and who satisfactorily complete 8 prescribed graduate units in their specialty.

Doctor of Philosophy. The doctor of philosophy degree is awarded to candidates who complete an approved program in their area of specialization and meet departmental and Graduate College requirements for the degree. These must include at least 24 graduate units beyond the bachelor's degree; satisfactory performance in courses or examinations dealing with quantitative methods, conceptual foundations of psychology, and chosen areas of specialization; a master's thesis or equivalent; appropriate advanced courses and seminars in the area of specialization and in related and supporting areas; satisfactory performance on a doctoral qualifying examination; satisfactory performance on an oral preliminary examination; completion of an acceptable PhD thesis; and satisfactory performance on an oral examination in defense of the thesis.

Although teaching is not a general Graduate College requirement, this department requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program. This usually takes the form of a teaching assistantship for at least one semester.

Medical Scholars Program. This program allows the student interested in medicine and psychology to earn both the MD and PhD (in psychology) degrees while gaining unique multidisciplinary research experience and expertise.

Individually tailored programs of study can be developed within the general requirements of medical training and graduate study in psychology. Degree work will be arranged to accommodate the scheduling requirements of both programs, but the course of study in psychology will be equivalent to that of all other doctoral candidates. More details about the Medical Scholars Program are available from the associate dean for academic affairs, College of Medicine at Urbana-Champaign, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building, 506 South Mathews Avenue, Urbana, IL 61801.

RADIO AND TELEVISION

Acting Head of the Department: James W. Carey
Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, 810 South Wright Street, Urbana, IL 61801

The Department of Radio and Television has suspended admission to its program leading to the master of science degree while it reviews the curriculum and decides on its plans for future instruction in broadcasting. Students interested in earning a master's degree in radio and television may write to the department head to learn the status of the department's plans. For the program leading to the Doctor of Philosophy in Communications, see page 73.

REGIONAL SCIENCE PROGRAM

Correspondence and Information: Regional Science Program, University of Illinois at Urbana-Champaign, 220 Davenport Hall, 607 South Mathews Avenue, Urbana, IL 61801
Program Committee: G.J.D. Hewings (chair), P.F. Colwell, J. Crihfield, K. Donaghy, C.D. Kolstad, H. Thomas, H.F. Williamson

Graduate Degree Programs. An interdisciplinary concentration in regional science is available for students enrolled in master's or doctoral degree programs in the following departments: agricultural economics, business administration, economics, finance, geography, and urban and regional planning. Program concentration varies by department and includes emphasis in transportation planning, regional development and planning, real estate and urban land economics, urban and regional analysis, and environmental systems and management. Core courses are taken in regional and social science theory, location theory, and methods of regional analysis; the specific core courses will depend upon background and major department. Further specialization may be pursued by making approved selections from among a rich array of more than forty regional science courses in the participating departments.

Admission. Prospective students should address inquiries to the program office. Applicants desiring a major or minor emphasis in regional science should seek admission to one of the cooperating departments. All degree candidates must complete the requirements of the department in which they enroll. Students specializing in regional science are expected to have a sound background in economics, statistics, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study.

REHABILITATION

Director of the Division: Paul Leung
Correspondence and Information: Director of Graduate Studies, Division of Rehabilitation Education Services, University of Illinois at Urbana-Champaign, 1207 South Oak Street, Champaign, IL 61820

GRADUATE FACULTY

Professor: P. Leung
Associate Professor: M.J. Armstrong, C. Schiro-Geist
Assistant Professors: G.G. Garske, B.N. Hedrick, M.G. Strauss, S.C. Weaver

Graduate Degree Program. The Division of Rehabilitation Education Services offers graduate work leading to a master of science degree. Individualized degree programs are available in general rehabilitation, rehabilitation administration, and rehabilitation counseling.

Admission. The Graduate College admission requirements apply. Applicants must hold a baccalaureate degree (or its equivalent) and have a grade-point average of at least 4.0 (A = 5.0) for the last 60 hours of undergraduate work and for any graduate work completed. Applicants

should have a degree in a rehabilitation-related discipline and/or a strong background in the social and biological sciences. Satisfactory Graduate Record Examination scores or Miller Analogies Test scores and an introductory statistics course are required. Applicants must submit a brief statement of their education and career goals and three letters of recommendation.

Master of Science. Candidates for the Master of Science in Rehabilitation must complete at least 10 units of graduate work. At least 3 units must be at the 400 level, and 2 of these must be in rehabilitation. A thesis is not required but may be written for 2 units of credit. A full-time student can complete the program in three or four semesters.

Resources and Facilities. The laboratory facilities and service programs that the division maintains in the Rehabilitation Education Center are outstanding and provide excellent resources for graduate study, research, and practical experience in most areas of rehabilitation.

Financial Aid. Fellowships, tuition and fee waivers, and assistantships are available on a competitive basis.

RELIGIOUS STUDIES

Director of the Program: Gary G. Porton
Correspondence and Information: Program in Religious Studies, University of Illinois at Urbana-Champaign, 3014 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

The Program in Religious Studies sponsors teaching, research, and public service in religious studies. Although the program does not itself offer graduate degrees, its eleven core faculty members, as well as its seventeen associated faculty members, regularly teach graduate-level courses and serve on thesis committees for other departments. Students interested in pursuing graduate work in religious studies should contact the director of the program to determine how they can best pursue their interests.

ROMANCE LINGUISTICS

Graduate Degree Programs. An option in Romance linguistics is available to candidates for the doctor of philosophy in the Departments of French; Linguistics; and Spanish, Italian, and Portuguese. The curriculum is based upon appropriate course offerings in the three departments. Further information may be obtained from the executive officers of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: D.P. Koenker
Correspondence and Information: Director, Russian and East European Center, University of Illinois at Urbana-Champaign, 104 International Studies Building, 910 South Fifth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: P.P. Bernard, E.C. Bristol, M.T. Choldin, M. Friedberg, J. Gorecki, F.M. Gottheil, K.A. Hitchins, H.H. Hock, R.C. Jennings, R.E. Kanet, D.P. Koenker, P.B. Maggs, H.P. Maguire, J.P. McKay, L.H. Miller, B. Nettl, T. Pachmuss, H.M. Schoenfeld, K.H. Schoeps, P.W. Schroeder, D.M. Shtohryn, M.G. Weinbaum, L. Zgusta
Associate Professors: M.H. Berry, R. Dunatov, F.Y. Gladney, S.P. Hill, R.G. Ousterhout, M.M. Shorish, O. Soffer-Bobyshev, R.V. Tempest, B. Uroff
Assistant Professors: J.W.R. Lepingwell, N.K. Pervukhin, M. Spagat, A.M. Verner

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is offered by the Russian and East European Center in cooperation with various departments. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follows: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least 6 graduate units in course work relating to Russia, of which at least 1/2 unit must be Library and Information Science 433C. The remaining units must be distributed among at least three of the departments represented in the program (anthropology, economics, geography, history, law, library and information science, political science, Slavic languages and literatures, and sociology) other than the student's own major department. If the student's major department is one of these nine, up to 1 unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources, which must meet, at the minimum, the standard usually required in a master's thesis. A copy of the student's master's or doctoral thesis may be submitted in fulfillment of this requirement.

SECOND LANGUAGE ACQUISITION AND TEACHER EDUCATION (SLATE)

Chair of SLATE Program: Sandra J. Savignon
Correspondence and Information: SLATE Program, 2090 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Bokamba, C. C. Cheng, W. Dickerson, B. Kachru, Y. Kachru, H. Maclay, S.J. Savignon, J.L. Walker
Associate Professors: L.F. Bouton, J.R. Cowan, G. Cziko, A.O. Hadley, M. Mack, A. Madsen, E. McClure, B. VanPatten
Assistant Professors: D. Andrews, F. Davidson, A.M. Escobar, G.E. Garcia, J.F. Lalande II, J.F. Lee, D. Lepetit, N. Markee, D. Musumeci, S. Shinall

Certificate of Advanced Study in Second Language Acquisition and Teacher Education. This certificate is offered by the multidisciplinary program in SLATE in cooperation with various departments. The Ph.D. program in SLATE is designed to provide advanced training for prospective teachers, researchers, and administrators concerned with second language learning and teaching. The SLATE program has the combined support of faculty members in a number of different departments in the University. The supporting faculty hold appointments in various departments across the University, including the Departments of Educational Psychology and Curriculum and Instruction (in the College of Education) and English as an International Language; French; Germanic Languages and Literatures; Linguistics; and Spanish, Italian, and Portuguese (in the College of Liberal Arts and Sciences). Students therefore have access to a wide range of resources within the University.

The SLATE program is designed to meet the individual needs of students. The course requirements in each affiliated department are generally flexible and allow freedom for students to pursue specialized goals. Students in recent years have studied in such subfields as error analysis, computer-assisted instruction, cognitive and affective factors in learning and teaching, communicative competence, reading strategies, and curriculum development. The unifying bond of such specialization is the young but rapidly growing discipline of second language learning and teaching.

Admission. Application to the SLATE program is made directly to one of the cooperating departments listed above. Admission is subject to all regulations of the Graduate College at the University of Illinois. The applicant must have an MA, MAT, or the equivalent in an appropriate related field. Generally, master's degrees in education, English as a second language, a foreign language, or linguistics are appropriate. The applicant must have a minimum grade-point average of 4.5 on a 5.0 scale (3.5 on a 4.0 scale) or the equivalent in

previous graduate work. Foreign applicants for whom English is a non-native language must satisfy English proficiency requirements before admission can be granted. Some experience in teaching a second language is recommended.

Financial Aid. Financial aid is granted only through individual departments. A limited number of teaching and research assistantships, tuition and fee waivers, and fellowships are available each year through cooperating departments. Applicants can indicate their desire for financial aid by checking appropriate boxes on the application for admission. Financial support for a limited number of qualified SLATE candidates may also be available through assignments in the Intensive English Institute, EOP Rhetoric Program, Language Learning Laboratory, or Office of Student Teaching. Applicants should contact these units directly for details. The SLATE Executive Committee itself administers no financial aid.

SLAVIC LANGUAGES AND LITERATURES

(Including Bulgarian, Czech, Old Church Slavonic, Polish, Russian, Serbian or Croatian, and Ukrainian)

Head of the Department: Maurice Friedberg
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: E. Bristol, M. Friedberg, T. Pachmuss
Associate Professors: R. Dunatov, F.Y. Gladney, S.P. Hill, R. Tempest
Assistant Professor: N. Pervukhin

Graduate Degree Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of Master of Arts in Russian, Master of Arts in the Teaching of Russian, and doctor of philosophy with specialization in Russian literature or Slavic linguistics.

Admission. Prospective graduate students of Slavic languages and literatures should have had the equivalent of at least three years of college Russian and some advanced course work in Russian literature. Some acquaintance with other languages and literatures is desirable. Students choosing Russian or other Slavic languages and literatures as a minor subject should consult the department. The Graduate College admission requirements apply.

Master of Arts in Russian. In addition to fulfilling the requirements of the Graduate College, candidates must pass both a written and an oral examination in their major and must pass the Russian proficiency examination. Students may specialize in literature or linguistics. All students must complete a departmental core program composed of courses in literature and linguistics. No master's thesis is required.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take (1) Russian (5 units, including at least 2 units from courses open only to graduate students); (2) education (2 units, including 1 unit in educational psychology and 1 unit in educational policy studies); and (3) electives (1 unit). These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 81 for teacher certification requirements.

Doctor of Philosophy. All candidates for the PhD degree must fulfill the general requirements of the Graduate College and must have a reading knowledge of two non-Slavic languages, ordinarily French and German. Students entering the program with an AM degree from another department or institution must pass a qualifying examination by the end of their second semester of full-time study in the department. A student may choose literature or linguistics as a major field. In addition to satisfying departmental language proficiency

requirements, students must complete 8 units of course work beyond the AM degree, of which at least 5 are within the student's major field of study. The student must also complete a minor consisting of three graduate-level courses in a single field, or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another modern Slavic language or literature in the original language. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other modern Slavic languages or literatures in the original languages. A PhD preliminary examination, consisting of written and oral portions on both major and minor fields, is required. A thesis is required for the degree of doctor of philosophy.

Graduate courses are offered in the following Slavic languages: Bulgarian, Czech, Old Church Slavonic, Polish, Russian, Serbian or Croatian, and Ukrainian.

Research Interests. Major areas include East, West, and South Slavic linguistics; language teaching pedagogy; and computer-assisted language teaching. In literature, the fields of specialization include Russian literature of all periods, particularly of the nineteenth and twentieth centuries, Russian literature and society, emigre Russian literature, the Russian romantic and symbolist poets, Russo-Western literary and cultural contacts, and Russo-Jewish literary relations. Other major areas of interest represented include the Soviet and East European cinema, literary translation, and Polish literature.

The University of Illinois at Urbana-Champaign has one of the country's two or three outstanding Slavic library collections. The Illinois Summer Research Laboratory on Russia and Eastern Europe brings to the campus more than one hundred postdoctoral researchers from all over the country every year to take advantage of the Slavic library resources. The library's unique Slavic reference service is in year-round operation, answering queries from libraries and individual scholars throughout the country.

Financial Aid. Several forms of financial assistance, including University fellowships, Foreign Language and Area Studies (Title VI) Fellowships, teaching assistantships, research assistantships, and tuition and service-fee waivers are available. There are also opportunities for part-time related work in the Slavic and East European Division of the University Library and elsewhere on the campus. Virtually all students making satisfactory progress are assured of some form of financial assistance and also receive the opportunity to acquire classroom teaching experience.

SOCIAL WORK

Dean of the School: Paula A. Meares
Correspondence and Information: Assistant Dean for Admissions, School of Social Work, University of Illinois at Urbana-Champaign, 1207 West Oregon Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: P. Balgopal, P. Meares, E. Mech
Associate Professors: C. Cowger, R. Downing, E. Gullerud, J. Kagle, N. Weinberg
Assistant Professors: M. Adamek, D. Dupper, S. Glynn, N. Gustavsson, S. Haagenstad, A. Halter, M. Kaplan, S. Kopels, J. Reinardy, J. Rycraft, S. Wernet
Emeritus Professors: L. Costin, K. Gould, P. Leuenberger, C. Henderson, F. Itzin, M. Monkman, M. Taber, A. Vattano

Graduate Degree Programs. The School of Social Work offers programs leading to the master of social work and the doctor of philosophy degrees.

Master of Social Work. The master's degree provides specialized study for advanced social work practice. Students take foundation and advanced courses in social work methods; organization and services; research, human behavior, and the social environment; and field instruction. (A twenty-nine week field placement in a social service agency is required.) A total of 14 to 16 units of graduate course work is required for the MSW degree, and the curriculum may be completed in sixteen to eighteen months of full-time study. Students choose from one of the following areas of specialization: child welfare, health care, community mental health, and school social work. Within each specialization, a direct service or an indirect service focus may be pursued. Students who wish to specialize in aging, marriage and family practice, occupational social work, substance abuse, or another individualized plan of study will have the opportunity to develop the area with a faculty adviser.

Admission. For the MSW program, applicants must meet the following minimum requirements: (1) a baccalaureate degree from an accredited college or university in the United States or from a recognized institution of higher learning abroad; (2) a grade-point average of 4.0 (A = 5.0) for the last 60 semester hours of undergraduate work; (3) 20 hours of completed course work in social, biological, and behavioral sciences; (4) evidence of personal attributes that are suitable for the profession of social work; (5) results of the Test of English as a Foreign Language (TOEFL) for any applicant whose native language is not English; (6) a course in elementary statistics; (7) a course in human development covering the life span; (8) foundation knowledge in human behavior and the social environment, including the family, small groups, communities, and organizations, as well as human biology; (9) a foundation course in research methods; (10) a written supplementary statement.

Doctor of Philosophy. The PhD program is typically a 16-unit program for students who enter with an MSW degree. The program is interdisciplinary and has a strong research emphasis. Anthropology, economics education, labor and industrial relations, political science, law, psychology, sociology, and urban planning are among the disciplines that contribute to the program. Candidates prepare for leadership in teaching, research, and policy analysis, development, and implementation.

Admission. The PhD program is open to students who demonstrate a potential for research and other scholarly work and leadership in the field of social welfare and the allied professions and who have had education in social work or in related professions or disciplines. A grade-point average of 4.0 (A = 5.0) is required for consideration. The Graduate Record Examination, three letters of recommendation, an example of written work, and in some cases the Test of English as a Foreign Language (TOEFL) are also required.

SOCIOLOGY

Head of the Department: James R. Kluegel
Director of Graduate Studies: John Mirowsky
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: D. Bordua, H. Choldin, N. Denzin, L. Estabrook, J. Gorecki, R. Jones, J. Kluegel, C. Kramarae, C. McPhail, J. Mirowsky, J. Robinson, C. Ross, A. Sofranko, J. Spaeth, S. Sudman, J.C. van Es, R. Warnecke
Associate Professors: S. Hatchett, R. Liebert, W. Martin, A. Pickering,, M. Solaun, G. Stevens, G. Swicegood, W. Trent, S. Wasserman, N. Wiley
Assistant Professor: C. Britt, M.H. Meyer, T. Liao
Emeritus Professors: W. Form, N. Jacobs, H. Johnson, B. Karsh, G. Lueschen

Graduate Degree Programs. The Department of Sociology offers graduate work leading to the doctor of philosophy degree.

Admission. The Graduate College admission requirements apply. Students applying for admission should have a strong background in one of the social sciences, preferably sociology. Applicants must submit Graduate Record Examination scores on the tests of verbal ability, quantitative ability, and analytical ability. The advanced test in sociology is optional. Nonnative English speakers must also submit TOEFL scores; the TSE is optional but recommended.

Doctor of Philosophy. Considerable specialization around a core of sociological knowledge is encouraged to prepare students for careers in research and teaching at the college and university level and for research careers in government and industry. Departmental programs include demography; international studies; criminology; social psychology; sociology of health; work, stratification, and organizations; sociology of science; and rural sociology. Substantive research and course work in race, ethnicity, and gender is offered within these programs. Required courses include sociological theory, statistics, research methods, demography, social organization, and social psychology. Doctoral candidates must pass a specialty examination and write and defend a dissertation.

Financial Aid. Financial support is provided for most graduate students through teaching assistantships, research assistantships, tuition and fee waivers, and other University and external financial support.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan)

Head of the Department: I.A. Schulman
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, 707 South Mathews Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: W.C. Blaylock, A.K. Cassell, E.P. Garfield, T.C. Meehan, A. Porqueras-Mayo, I.A. Schulman
Associate Professors: A. Aiex, P.W. Borgeson, A. Musumeci, B. VanPatten, J.C. Wilcox
Assistant Professors: L.M. Brocato, L.E. Delgado, V. Díaz-Balsera, A.M. Escobar, J.I. Hualde, J.F. Lee, D.M. Musumeci, P. Sharpe, J.L. Tolliver

Graduate Degree Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy in Spanish, in Italian, and in Portuguese; to a Master of Arts in the Teaching of Spanish; and to a Doctor of Philosophy in Second Language Acquisition in Teacher Education (SLATE) in Spanish, Italian, or Portuguese. Fields of concentration are Spanish linguistics, Romance linguistics, Spanish literature, Latin American literature, Italian linguistics, Italian literature, and Portuguese language and literature. A graduate course in Catalan literature is available.

Admission. The Graduate College admission requirements apply. The normal prerequisite for a graduate major is an undergraduate major in the corresponding Romance language or consent of the department. Applicants living in the United States are required to submit Graduate Record Examination scores for the aptitude test. Students doing graduate work for any advanced degree in Spanish, Italian, or Portuguese must possess a command of the language.

The programs offered are described below. For additional information, consult the department.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and a general reading list. Areas of specialization offered in Spanish are Spanish and Spanish American literature, Spanish linguistics, and applied Spanish linguistics. Areas of specialization offered in Italian are Italian literature, Italian linguistics, and applied Italian linguistics. Areas of specialization offered in Portuguese are Brazilian literature and Portuguese literature. Detailed statements of the requirements for each specialization may be obtained from the department.

Master of Arts in the Teaching of Spanish. An applicant must have a bachelor's degree in either Spanish or teacher education. Candidates must complete a total of 9 units to be taken in various areas (Spanish, foreign language learning, general education, linguistics, etc.) approved by the adviser in conjunction with the candidate's interests, background, and needs.

Doctor of Philosophy. Areas of specialization offered in Spanish are Medieval literature, Renaissance and Golden Age literature, Spanish literature of the nineteenth and twentieth centuries, Latin American colonial literature, Latin American modern and contemporary literature, Spanish linguistics (with various subfield specializations), and Romance linguistics (with various subfield specializations). Areas of specialization offered in Italian are Medieval literature, Renaissance literature, Baroque literature, Enlightenment and Romanticism, modern literature, Italian linguistics (with various subfield specializations), and Romance linguistics. Areas of specialization offered in Portuguese are Medieval literature, Renaissance literature, modern literature, Brazilian literature (through Romanticism or after 1881), and Romance linguistics.

The option in SLATE is available to candidates with an MA degree in Spanish (applied linguistics), Italian (applied linguistics), Portuguese, and at least one year of experience teaching in a second language context. Candidates selecting this option are required to complete courses in linguistics, psycholinguistics, sociolinguistics, and curriculum development, in addition to advanced study in Spanish, Italian, or Portuguese linguistics. Also required are 2 units in research methodology. Although teaching is not a general Graduate College requirement, this department usually requires PhD candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Financial Aid. The department offers fellowships to outstanding applicants to the graduate program and regularly provides a large number of teaching assistantships, research assistantships, and fellowships for the study of the works of Jose Marti. The Graduate College fellowship competition is open for qualified minority candidates. Other fellowships and grants are available in campuswide competitions (Latin American Center grants, dissertation research grants, summer fellowships, and others).

SPEECH AND HEARING SCIENCE

Head of the Department: Peter J. Alfonso
Correspondence and Information: Head, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, 901 South Sixth Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.C. Bilger, D.P. Kuehn, E. Yairi
Associate Professors: J.G. Erickson, C.J. Johnson, M.A. O'Neill, R.K. Simpson
Assistant Professors: R.D. Chambers, L.E. Rowan
Emeritus Professors: F. Johnson, E. Paden, W.R. Zemlin, J.J. O'Neill

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination is required for all curricula. Desired background should include 16 hours of undergraduate credit in the following areas or their equivalent: speech pathology, audiology, phonetics, anatomy and physiology of the vocal mechanism, hearing science, speech science, and voice science.

Graduate Degree Programs. The department offers courses leading to the master of arts and doctor of philosophy degrees, with specialization in audiology, language development and its disorders, speech or hearing science, and speech pathology.

Master of Arts. In pursuing a master of arts degree, students may concentrate in one of four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. This degree may be taken as either a terminal degree or as preparation for further graduate study.

For students seeking a terminal degree, the master of arts program is designed to ensure them clinical competence in audiology or speech/language pathology necessary for employment in a hospital, clinic, residential center, or school system. Successful completion of this program ensures that the student has met the academic and clinical requirements for American Speech-Language-Hearing Association (ASHA) certification and can possibly qualify for state certification.

For a student seeking a nonterminal degree, the master of arts program enables the student to undertake fundamental course work that will be an integral part of an overall doctoral program.

The student's program for the master of arts degree will be determined on an individual basis, taking into consideration the Graduate College and departmental requirements. It will be composed of 10 to 13 units from the four specialized areas and related areas. At least $6^1/_2$ to 7 units must be at the 400 level. The only courses required of all master of arts candidates are Speech and Hearing Science 399 (Design and Analysis of Experiments in Speech and Hearing Science) and Speech and Hearing Science 496 (Proseminar in Speech and Hearing Science). A master's thesis should be part of the predoctoral student's plan of study. A student seeking a master of arts as a terminal degree is encouraged to do a thesis as educational enrichment.

Doctor of Philosophy. Admission to the doctoral program requires completion of a master's degree, or the equivalent, in speech and hearing science or a related area. The program may be planned with specialization in any one of the four areas: audiology, language development and its disorders, speech and hearing science, or speech pathology. The minimum academic course requirements for this degree are 8 units beyond the master's degree and a thesis. If there are deficiencies in the student's background, additional courses will be required; courses taken for this purpose usually are not counted toward the minimum requirement. In addition, a doctoral candidate who did not write a thesis as part of the master's program will be required to complete the equivalent of a master's thesis; these 2 units will not count toward the minimum academic requirement of 8 units. Individual programs of study will be tailored to the student's special needs and are planned by the student and the adviser.

For the student who enters with no deficiencies, the first year or two of the doctoral program is typically devoted to course work in the area of concentration selected by the student and

terminates when the preliminary examination is passed. Subsequent time is devoted to research on a special topic and culminates with writing a thesis and passing an oral examination in its defense.

SPEECH COMMUNICATION

Head of the Department: Jesse G. Delia
Director of Graduate Study: Daniel J. O'Keefe
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: K.E. Andersen, J.J. Bateman, R.A. Clark, J.G. Delia, L. Grossberg, C. Kramarae, J.H. Maclay, D.L. Swanson
Associate Professors: T.M. Conley, D. Desser, J.W. Hay, P.J. Miller, B.J. O'Keefe, D.J. O'Keefe, J.W. Wenzel
Assistant Professors: N.S. Contractor, A.L. Darling, D.P. Gaonkar, J. Jasinski

Admission. In addition to the Graduate College requirements, the general (aptitude) portion of the Graduate Record Examination and a sample of written academic work are required in all curricula.

Graduate Degree Programs. The Department of Speech Communication offers courses leading to the master of arts, the doctor of philosophy, and the Master of Arts in the Teaching of Speech Communication degrees. Specific information on programs of graduate study and financial aid is supplied upon request. Financial aid is usually in the form of part-time teaching assistantships.

Master of Arts. For the degree of master of arts, students may concentrate in rhetorical and communication theory or in interpretation. The entering student should present the equivalent of 16 hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general graduation requirements of the Graduate College, candidates must pass a final written examination. In some cases an oral examination is also stipulated. A thesis is optional, but may constitute a maximum of 2 units of credit.

Master of Arts in the Teaching of Speech Communication. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College and departmental requirements, including the comprehensive examination, MAT candidates must complete 6 units of work in the department plus the units of required work in education (see page 79).

Doctor of Philosophy. For the doctor of philosophy degree, students may concentrate in rhetoric and communication theory or interpretation. To be accepted as candidates for the PhD degree, students must present either a well-rounded undergraduate education with an emphasis in speech communication and a master's in a cognate discipline, or they must hold a master's degree in speech communication from an accredited institution.

In addition to meeting general requirements of the Graduate College, the student must satisfactorily complete written and oral preliminary examinations, an oral defense of the thesis prospectus, and an oral defense of the thesis. Students must demonstrate competency in research procedures and tools that may include proficiency in one or more foreign languages, various research methods, or cognate academic work.

STATISTICS

Chair of the Department: Walter Philipp
Correspondence and Information: Department of Statistics, University of Illinois at Urbana-Champaign, 101 Illini Hall, 725 South Wright Street, Champaign, IL 61820

GRADUATE FACULTY

Professors: R.E. Bohrer, D. Burkholder, D.D. Cox, I.J. Hubert, P.B. Imrey, K. Joag-Dev, J.I. Marden, W. Philipp, S.L. Portnoy, J. Sacks, W.F. Stout, S. Wasserman
Associate Professors: A.R. Barron, A.T. Martinsek, D. Monrad, D.G. Simpson
Assistant Professors: J. Alho, W. Wu, Z. Ying
Emeritus Professors: F.B. Knight, R.A. Wijsman

Admissions. The Graduate College admission requirements apply. Students are expected to have a strong undergraduate mathematics background, but need not have an undergraduate statistics or mathematics degree. Students may be admitted with deficiencies which are to be removed during the first year of graduate work.

Graduate Degree Programs. The Department of Statistics offers graduate study leading to the master of science or master of arts, the Master of Science in Applied Statistics with Specialization, and the Doctor of Philosophy in Statistics.

Master's Degree Program. The MS and MA degrees in Statistics require 8 units of graduate course work covering both theoretical and applied material. Statistics 324, 325, 326, 327, 410, and 411 are required. At least one additional course at the 400 level is also required. There is no language or thesis requirement, and there are no comprehensive examinations.

Applied Master's Degree with Specialization. The Department of Statistics offers the Master of Science in Statistics with specialization in a variety of areas of application. The degree program consists of a core of three courses in basic statistical theory from the Department of Statistics, a course in general data analysis, and further course work in a particular discipline as required separately for each specialization. The program offers an additional degree for students earning an advanced degree in the area of application or provides the primary degree for a master's candidate in applied statistics who is interested in a specific disciplinary application.

To be eligible for this program, students must be accepted into either the unit offering the specialization or the Department of Statistics. The following areas of application are now available: social statistics (Department of Sociology); psychometrics and behavioral statistics (Departments of Psychology, Educational Psychology, and Speech and Hearing Science); biostatistics (Department of Biology and the Medical Scholars Program); statistical genetics (Departments of Agronomy and Animal Science).

Full statements of degree requirements are available from the head of the unit offering a specialization or from the head of the Department of Statistics.

Doctoral Degree Program. A total of 24 units after the baccalaureate is required for the doctor of philosophy degree. These include Statistics 324, 325, 326, 327, 356, 410, 411, 425, 453, 454, 471, 475, and 478. This degree also requires successful completion of the qualifying examination (consisting of examinations on Statistics 324-325, 410-411, and 453-454); a thesis in an area of theoretical, computational, or methodological statistical research; and a final examination on the thesis.

Financial Aid. Financial aid is available primarily in the form of teaching assistantships, research assistantships, and fellowships. For further information write to the head of the department.

THEATRE

Head of the Department: David Knight
Correspondence and Information: Head, Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, 500 South Goodwin Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: J.C. Ahart, J.B. Harris, B.M. Hobgood, J. Hurt, D. Knight, J. Maclay, W.M. Knight, C. Neely, R. Tymchyshyn, R. Wheeler, B.R. Works
Associate Professors: P. Davis, J. Dunn, R. Graves, A. Kaufman, D. Kay, R. McFarquhar, T. Mitchell, M. Mullin, M. Shapiro, J. Stottlar
Assistant Professors: K. Perkins, C. Sevec, M. Sims

Admission. Applicants will be considered if they present transcripts documenting undergraduate or graduate study of dramatic literature, theatre history, and theatre practice; in the case of the MFA degree, intensive experience in performance and/or production of plays is necessary, whether or not this activity occurred in an academic context. The faculty expects all applicants to have a cumulative grade-point average of at least 4.0 (A = 5.0) in the study of theatre subjects; AM and PhD candidates should have a 4.0 grade-point average in all subjects studied at the graduate or undergraduate levels.

Graduate Degree Programs. The Department of Theatre offers graduate work leading to the degrees of master of arts, master of fine arts, and doctor of philosophy.

Master of Arts. A candidate for the AM degree must spend at least two semesters in residence; must complete at least 8 units of course work in theatre and related studies, including at least 5 units in history and theory of theatre and 2 in applied theatre; and must pass a final comprehensive examination. Three units must be at the 400 level, and 2 of the 3 must be in theatre. A full-time student can complete this program in one academic year.

Master of Fine Arts. The MFA is a terminal degree in theatre practice. Approved areas of specialization include acting, costume design, lighting design, scene design, stage management, and theatre technology. The candidate for the degree must be in residence six semesters and complete 18 units. In the Design/Technical and Management Programs, course work must include at least 8 units in colloquium or creative projects, 3 units in theatre history, and 7 others in department-approved electives. In the Acting Program, course work includes 12 units in studio, 1 unit in theatre history, and 5 units in department-approved electives. Only full-time students will be admitted to the program.

Doctor of Philosophy. Requirements for the degree are a minimum of 8 units in courses in theatre and related studies beyond the master's degree; a reading knowledge of one foreign language; a minimum of 8 units of thesis research; a comprehensive oral and written examination; an oral or written special-field examination; and defense of the dissertation before a committee of the graduate faculty. The program can be completed in two to three years beyond the master's degree.

THEORETICAL AND APPLIED MECHANICS

Acting Head of the Department: Donald E. Carlson

Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 216 Talbot Laboratory, 104 South Wright Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: R.J. Adrian, D.E. Carlson, G.A. Costello, R.B. Haber, R.E. Johnson, R.E. Miller, J.W. Phillips, J.S. Walker

Associate Professors: J.G. Harris, D.N. Riahi, D.S. Stewart, R.L. Weaver

Assistant Professors: S. Balachandar, K.J. Hsia, C.J. Lawrence, T.G. Shawki, P. Sofronis, N.R. Sottos, S.R. White

Admission. Applicants should have the bachelor's or master's degree in engineering, mathematics, physics, or related fields and meet the Graduate College requirements for admission.

Graduate Degree Programs. The graduate programs in the Department of Theoretical and Applied Mechanics lead to the master of science and doctor of philosophy degrees. Major areas of study and research are applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics.

Master of Science. Candidates must complete a minimum of 8 units of graduate work including a thesis (ordinarily 2 units) and maintain a minimum grade-point average of 4.0 (A = 5.0). Students are required to register for the seminar in engineering mechanics. If a student elects not to present a thesis, 9 units of course work are required. Three units must be at the 400 level, and 2 of the 3 must be in theoretical and applied mechanics. A full-time student can usually complete this program in one academic year of study. A student who has an assistantship can usually complete the requirements in one calendar year.

Doctor of Philosophy. Candidates for the doctor of philosophy degree are required to complete 8 units of course work beyond the master's degree with a minimum grade-point average of 4.0. One course (or the equivalent) is required from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics. Students are required to register for the seminar in engineering mechanics. A student must pass an oral preliminary examination before commencing the thesis. The thesis research usually constitutes about half of the work beyond the master's degree. A full-time student can usually complete the doctoral program in two years of study beyond the master's degree.

Research Interests. In *solid mechanics and materials,* current research topics include finite elements for composite plates and shells, woven structures, circuit-board laminates, polymer-matrix microcracking, interphase mechanics; topology optimization, canonical functions and design sensitivity, moving-grid methods, visualization environments; creep resistance and creep failure, hydrogen embrittlement, brittle-to-ductile transitions, dislocation emission, shear instabilities, powder consolidation; implant materials. In *fluid mechanics,* topics include turbulent thermal convection, conditional eddies, boundary-layer instabilities; coating flows, foams and emulsions, dense solid-liquid flows, melt crystallization, materials processing, combustion; particle-image velocimetry. In *dynamics,* topics include scanning acoustic microscopy, nondestructive evaluation, stochastic wave propagation, complex-structure coherence, and wave scattering.

Financial Aid. Half-time teaching and research assistantships allow students to take three-quarters of a full schedule of graduate courses. Stipends are based on the student's year in graduate work and on the percentage of time spent on the assistantship. Teaching and research assistantships carry with them waivers of tuition and some service fees. Assistantship applications can be made at any time before the term of entrance. Partial fellowships are also available.

URBAN AND REGIONAL PLANNING

Head of the Department: Lewis D. Hopkins
Correspondence and Information: Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 907 1/2 West Nevada Street, Urbana, IL 61801

GRADUATE FACULTY

Professors: C.W. Forrest, L.F. Heumann, G.J.D. Hewings, L.D. Hopkins, T.J. Kim
Associate Professors: R.A. Herendeen, G.K. Knaap, L.L. Osborne, P.D. Phillips
Assistant Professors: K.P. Donaghy, R.V. George, E.K. Husband, R.B. Olshansky, J.A. Pressley, K.M. Reardon

Admission. While the social sciences, the physical sciences, the design professions, engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities and other fields. The Graduate College admission requirements apply. International applicants must score 590 or better on the TOEFL. The Graduate Record Examination is recommended for applicants who want financial aid. The additional requirements described below apply for admission to the doctoral program.

Graduate Degree Programs. The Department of Urban and Regional Planning offers graduate work leading to the degrees of Master of Urban Planning and Doctor of Philosophy in Regional Planning. Students can also apply to dual degree programs to obtain a Juris Doctor and a Master of Urban Planning or a Master of Architecture and a Master of Urban Planning.

Master of Urban Planning. The fully accredited master's degree program prepares students for careers in professional practice. Such careers involve public service at all levels of government, private consulting practice, or other organizations in need of planning services. The program also may prepare students for advanced work leading to the PhD degree and a career in teaching and research. The program combines core requirements with a student selected concentration and electives. The program ordinarily requires two years. First-year students take courses focusing on the basic elements of planning, including planning theory, land use, history, analytical methods, spatial organization, and implementation. The second year provides opportunity for further work in areas of specialized interest, including environment, economic development, regional science, information systems, land use, housing, community development, transportation, and preservation planning. A thesis or a master's project is required. An internship during the summer between the first and second year is highly recommended.

To qualify for the Master of Urban Planning degree, a student must complete a minimum of either (1) 15 units if a zero-credit internship course (Urban Planning 490) is successfully completed or (2) 16 units if the internship course is not elected. At least 10 units must be in urban and regional planning courses (9 units for students completing Urban Planning 490). At least 4 units must be at the 400 level, and 3 of these must be in urban and regional planning.

Doctor of Philosophy in Regional Planning. The doctoral program is offered in close cooperation with an interdisciplinary program faculty. The program is designed to educate researchers and teachers for university positions as well as specialized practitioners for the public and private sectors. The program emphasizes environmental science and social science aspects of regional planning and incorporates the necessary background in research methods and planning theory and application. Students wishing to pursue environmental science aspects of regional planning should have completed at least three courses in physics, chemistry, or biology; one semester of college-level calculus or linear algebra; one semester of statistics; and one semester of economics. Students wishing to pursue social science aspects of regional planning should have completed at least one semester of economics; three semesters of other social sciences courses, such as economics, political science, or sociology; one semester of statistics; and one semester of college-level calculus or linear algebra. Students otherwise qualified may be admitted with deficiencies in these areas. Deficiencies may be removed by

passing proficiency examinations or by taking courses after admission to the program, but courses taken for this purpose will not count toward fulfillment of degree requirements.

To qualify for the PhD in Regional Planning, 24 units of credit must be completed. The student entering with the baccalaureate degree will be required to complete at least 16 units of course credit and up to 8 units of dissertation credit. The student entering with a master's degree in planning or a closely allied field generally will be required to complete a minimum of 8 units of course credit and up to 8 units of dissertation credit. A maximum of 8 units of advanced-standing credit may be granted. All student programs will consist of courses in planning research methods and planning theory and application. Depending on the program emphasis that a student selects, appropriate courses in environmental science or social science aspects of regional planning will be chosen in consultation with the student's academic adviser. The student must pass a qualifying examination, a preliminary examination of the dissertation proposal, and a final examination on the dissertation.

Faculty Research Interests. Members of the faculty are engaged in research, public service, and continuing education through the Bureau of Urban and Regional Planning Research. These efforts are undertaken in the areas of land use, economic development, environmental planning, housing, information systems, social planning, transportation, preservation planning, and regional science.

Library Resources. The department has one of the finest planning libraries in the world, with a collection of books and reports developed during the more than seventy-five years that planning education has been offered at this university.

Computing Resources. The department has an instructional computing laboratory with sophisticated graphic workstations to support planning decision making.

Financial Aid. Fellowships, tuition and service fee waivers, teaching assistantships, and research assistantships are available each year. Financial aid is awarded on the basis of the student's previous academic record and other indicators of potential. In the case of assistantships, the possession of specific teaching or research capabilities is a consideration.

VETERINARY MEDICAL SCIENCE

Dean of the College of Veterinary Medicine: Victor E. Valli

The College of Veterinary Medicine has realigned the administration of its graduate programs from a single program (veterinary medical science) to three programs corresponding to the college's academic departments (veterinary biosciences, veterinary clinical medicine, and veterinary pathobiology). Graduate students are admitted directly to one of the three academic department programs.

Veterinary Biosciences

Head of the Department: Richard F. Bevill

Correspondence and Information: Department of Veterinary Biosciences, University of Illinois at Urbana-Champaign, 3516 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.J. Benson, R.F. Bevill, W.B. Buck, L.E. Davis, L.G. Hansen, J.E. Hixon, G.L. Jackson, G.D. Koritz, T.F. Lock, M. Manohar, R.S. Ott, A.J. Parker, E. Small, C.W. Smith, J.C. Thurmon, M.E. Tumbleson, A.R. Twardock, W.C. Wagner

Associate Professors: V.R. Beasley, A.S. Hassan, K.R. Holmes, G.A. Iwamoto, E.H. Jeffery, G.J. Pijanowski, M.R. Simon

Assistant Professors: L. Abbott, D. Bunick, M. Chambers, P.S. Cooke, J.C. Eurell, T.E. Eurell, R.A. Hess, G.B. Sherman

Admission. Applicants for graduate study in veterinary biosciences must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those with or without the DVM degree and on the entire professional curriculum for those with the DVM degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional records. Qualifications of students must be approved by the department's Graduate Admissions Committee.

Graduate Degree Programs. The Department of Veterinary Biosciences offers graduate work leading to the degrees of master of science and doctor of philosophy. Areas of specialization include morphology, bioengineering, physiology, pharmacology, toxicology, and nuclear medicine. Each area has a core of required courses supplemented by other courses within the Department of Veterinary Biosciences and from other departments of the Graduate College. Laboratory and animal holding space is provided in the Basic Sciences Building, Veterinary Teaching Hospitals, and the Veterinary Research Farm.

Master of Science. The requirements for the degree are (1) 8 units of graduate credit, of which 4 units must be in veterinary biosciences, with at least 3 of the units in courses at the 400 level; (2) 1/4 unit of veterinary biosciences seminar credit; (3) a thesis on original research; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree include (1) 24 units of graduate credit, with at least 16 units (including thesis research) earned in courses meeting on the Urbana-Champaign campus, on the Chicago campus, or in other locations approved by the Graduate College for graduate credit; (2) 1/2 unit of veterinary biosciences seminar credit; (3) a reading proficiency in one foreign language or a functional competency in a computer language; (4) passage of the preliminary examination; and (5) a satisfactory original thesis and defense of the thesis in a final examination.

Specialization in Genetics.* The Department of Veterinary Biosciences offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. A limited number of research and teaching assistantships or associate positions are available.

**A proposal to establish a specialization in genetics is pending campus approval.*

Veterinary Clinical Medicine

Head of the Department: H. Fred Troutt

Correspondence and Information: Department of Veterinary Clinical Medicine, University of Illinois at Urbana-Champaign, 242 Small Animal Clinic, 1008 West Hazelwood Drive, Urbana, IL 61801

GRADUATE FACULTY

Professors: G.J. Baker, G.J. Benson, B.O. Brodie, T.J. Burke, L.E. Davis, J.L. Dorner, L.C. Helper, W.E. Hoffman, T.F. Lock, D.R. Nelson, R.S. Ott, A.J. Parker, E. Small, C.W. Smith, J.C. Thurmon, W. J. Tranquilli, H.F. Troutt, A.R. Twardock, H.L. Whitmore

Associate Professors: D.P. Bane, K.L. Campbell, R.B. Clarkson, J.H. Foreman, T.E. Goetz, A.L. Johnson, S.K. Kneller, D.R. Krawiec, J.M. Losonsky, B.C. McKiernan, D.D. Sisson

Assistant Professors: J.A. Cloran, P.A. Gerding, C.L. Greenfield, L.L. Hungerford, I. Kakoma, S. Manfra, D.J. McKenna, D. Morin, D.A. O'Keefe, G.C. Petersen

Admission. Admission requirements include a Doctor of Veterinary Medicine (DVM) degree or equivalent. By petition, non-DVMs may be admitted. Applicants for graduate study in veterinary clinical medicine must have a minimum grade-point average of 4.0 (A = 5.0). Admission averages are computed from the entire professional curriculum or from the last 60 hours of undergraduate studies for those without the DVM degree. Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on limited status on the basis of individual merit. Applicants who have a prior graduate degree or who have completed some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional records. Acceptance of students must be approved by the department's Graduate Committee.

Graduate Degree Program. The Department of Veterinary Clinical Medicine offers a graduate program leading to the master of science degree. The primary goal of graduate programs in veterinary clinical medicine is to prepare students for careers involving research and/or teaching in a specialty area. Graduate work in veterinary clinical medicine may be pursued in several areas, including anesthesiology, equine medicine and surgery, food animal medicine and surgery, ophthalmology, radiology, small animal medicine, small animal surgery, swine medicine, and theriogenology (animal reproduction). The department, with the teaching hospital, has facilities and equipment for studies of clinical aspects of diseases and other conditions in domestic species.

After completing graduate work, the student will be able to conduct research both independently and as a team member. Adequate training in planning research projects and writing research proposals will give the student the ability to function with teams of scientists from various areas of the biomedical field. Experience in clinical teaching and literature study will form the basis for the student's development of teaching programs within his or her discipline.

A residency program, designed to train a veterinarian for specialty clinical practice, can be combined with the graduate program. While a graduate program can be accomplished in a shorter time period, the duration of combined programs is usually three years, reflecting the time required to satisfy the objective of each program. Details of the residency program can be obtained from the head of the Department of Veterinary Clinical Medicine.

Master of Science. The master's degree in veterinary clinical medicine includes completion of a thesis that conforms to VCM requirements.

The credit requirements for the master's degree are in accordance with those of the Graduate College. The minimum is 8 units, no more than 3 units of thesis credit may be included in any 8-unit program. At least 3 units must be in 400-level courses (exclusive of 499 and 490) and 2 of the 3 units must be in the student's major field of study. To maintain good standing in a graduate program, a student must have a cumulative grade-point average of at least 4.0 (A = 5.0). One statistics course is required.

The candidate must complete all requirements of the department and the Graduate College and pass the stipulated examinations. The final MS examination consists of a presentation of the dissertation in the form of a departmental seminar (VCM 490). The seminar is followed by an oral examination administered by the candidate's committee and the department head. The student must demonstrate the ability to design and conduct independent research in order to be granted the MS degree.

Financial Aid. A limited number of teaching associate positions are available.

Veterinary Pathobiology

Head of the Department: Kenneth S. Todd, Jr.
Correspondence and Information: Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2522 Veterinary Medicine Basic Sciences Building, 2001 South Lincoln Avenue, Urbana, IL 61801

GRADUATE FACULTY

Professors: L.G. Biehl, J.A.D. DiPietro, J.L. Dorner, W.M. Haschek-Hock, D. Segre, R.D. Smith, G.D. Taylor, K.S. Todd, Jr., D.N. Tripathy, V.E. Valli
Associate Professors: R.M. Bunte, R. DoCampo, H.B. Gelberg, E.C. Hahn, W.E. Hoffmann, R.E. Isaacson, M.S. Kuhlenschmidt, M. Segre, D.A. Stahl, A.R. Smith, H.E. Whiteley, E.R. Vimr, J.F. Zachary
Assistant Professors: G. Foley, L.L. Hungerford, C.J. Jones, I. Kakoma, U.D. Kitron, L.D. Morton, G. Scherba, S.Z. Shapiro, M.A. Wallig, R.M. Weigel, F.A. Zuckerman

Admission. Applicants for graduate study in veterinary pathobiology must have a minimum grade-point average of 4.0 (A = 5.0). Applicants with a grade-point average between 3.5 and 4.0 may be considered for admission on a probationary status on the basis of individual merit. Grade-point averages will be calculated on the last 60 hours of undergraduate studies for those without the DVM degree or on the entire professional curriculum for those with the DVM degree. Applicants with a graduate degree or with some graduate course work will be evaluated on the basis of their graduate work as well as their undergraduate or professional record. Qualifications of students must be approved by the department's committee on admission of graduate students.

Graduate Degree Programs. The Department of Veterinary Pathobiology offers graduate work leading to the degrees of master of science and doctor of philosophy. Areas of specialization include epidemiology, immunology, microbiology, parasitology, clinical pathology, and pathology. Each specialty area has a core of required courses supplemented by other courses within the Department of Veterinary Pathobiology and from other departments of the Graduate College.

Master of Science. The requirements for the degree are (1) 8 units of credit, of which 4 units must be in veterinary pathobiology, with at least 3 of the units in courses at the 400 level; (2) 1/4 unit of veterinary pathobiology seminar credit; (3) a thesis on original research or a publishable manuscript; and (4) a final comprehensive examination.

Doctor of Philosophy. The requirements for the degree are (1) 24 units of credit (8 units toward the PhD degree are allowed for an MS degree completed elsewhere), 12 units of which (including thesis research) must be in the Department of Veterinary Pathobiology and 6 units in other departments of the Graduate College; (2) 1/2 unit of veterinary pathobiology seminar credit; (3) reading proficiency in either French, German, Russian, or Spanish (other languages may be approved by petition); (4) passage of the preliminary examination; and (5) a satisfactory original thesis and defense of the thesis in a final examination.

Specialization in Genetics.* The Department of Veterinary Pathobiology offers an area of specialization in genetics. The program is flexible and provides the student with proficiency in several areas of genetics, including molecular genetics, developmental genetics, and evolutionary and population genetics. Students electing this area should have completed course work in calculus, computer sciences, basic genetics, and biochemistry. The program of study for each student in the specialization is decided individually. Interested students should direct inquiries and applications to the department.

Financial Aid. A limited number of teaching and research assistantships or associate positions are available.

**A proposal to establish a specialization in genetics is pending campus approval.*

WOMEN'S STUDIES PROGRAM

Correspondence and Information: Director, Women's Studies Program, University of Illinois at Urbana-Champaign, 708 South Mathews Avenue, Urbana, IL 61801

The Women's Studies Program (WSP) is an interdisciplinary academic unit in the College of Liberal Arts and Sciences. Twenty-five UIUC faculty members associated with the Women's Studies Program offer undergraduate and graduate courses through the WSP or their home departments, with an emphasis on women's studies. Among the many graduate offerings are courses in feminist theory and research in both the humanities and the social sciences, as well as Gender Roles in International Development. Students interested in women's studies should enroll in a degree program in one of the participating departments.

WRITING STUDIES

Director of the Center for Writing Studies: Gail E. Hawisher
Correspondence and Information: Center for Writing Studies, University of Illinois at Urbana-Champaign, 201 English Building, 608 South Wright Street, Urbana, IL 61801

The Center for Writing Studies facilitates research and promotes graduate study in the areas of rhetoric, written composition, language, and literacy. The center offers graduate students pursuing MA or PhD degrees in participating departments a program leading to a specialization in writing and literacy research.

Admission. Students are invited to apply through participating departments and programs, including the Department of English, the Department of Speech Communication, the Division of English as an International Language, and the College of Education.

Faculty and students in CWS focus their interests around three principal areas: the historical, the theoretical, and the empirical study of writing. Specific faculty interests include research in computers and composition studies, methods of rhetorical and functional language analysis, cognitive processes in message production, the development of language and literacy theory and policy, and problems in technical and scientific writing. Graduate students affiliated with CWS may also explore the aesthetic, social, and cultural dimensions of language and relate theories of writing to theoretical work in criticism and linguistics, as well as to anthropology, psychology, reading, and education.

Graduate training in scholarship and research is accompanied by an equally thorough preparation for teaching. Students who affiliate with CWS are eligible for a teaching or research assistantship as soon as they begin their program and are assisted through a week-long orientation and advising program. They also participate in professional seminars in the teaching of composition, business and technical writing, the tutoring of writing, and other courses related to writing across the curriculum and composition studies. Graduate students may work as tutors in the writer's workshop as writing instructors, as teacher trainers and supervisors in the Writing across the Curriculum program, and as research assistants to the faculty of the center. CWS is also home to *Computers and Composition*, a journal for teachers of writing, and the *CCCC Bibliography of Composition and Rhetoric*.

Financial Aid. Graduate students are eligible for teaching and research assistantships in several different areas of composition studies and are given full responsibility for their own sections. Tuition and fees are waived for graduate students who hold assistantships.

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